

Spinal Cord Injury in Wisconsin: 1990 to 1994

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Wisconsin Department of Health and Family Services
Division of Supportive Living
Bureau of Aging and Long Term Care Resources
Office for Persons with Physical Disabilities

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Introduction

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Introduction to Spinal Cord Injury

Introduction

The establishment of a statewide registry and surveillance program is necessary in order to clearly identify factors and demographics associated with the population of individuals that sustains spinal cord injuries (SCI). Accurate incidence, prevalence and economic information about disabilities caused by traumatic injuries have been lacking in Wisconsin.

This first Wisconsin Spinal Cord Injury Report represents a historical overview of spinal cord injuries in Wisconsin from 1990 to 1994. The data presented in this report includes hospital discharge data related to spinal cord injuries with ICD-9-CM diagnostic codes 806.00-806.99 (fracture of vertebral column with spinal cord injury) and 952.00-952.99 (spinal cord injury without evidence of spinal bone injury). In analyzing this data, questions arose relevant to the validity of the coding by hospitals. It was questioned whether all injuries with an ICD-9-CM code of 806 and 952 resulted in spinal cord injuries with permanent neurological deficit necessitating an inpatient rehabilitation stay. A process of screening the coding was developed (see Data section) and has resulted in two different data sets. This report presents all data with an ICD-9-CM code of 806 and 952 (the only information needed based on Center for Disease Control and Prevention Guidelines). Once the screening process has been studied and verified, a second report with the data with the 806 and 952 codes screened as injuries resulting in permanent neurological deficit necessitating an inpatient rehabilitation stay will be issued. Additionally, within this data it is possible that the same person could be hospitalized more than once during a particular year. In order to avoid counting duplicate hospital visits, only the initial hospital visit data is included in the report, except for the "length of stay" and "cost of stay" data. These exceptions were figured from all hospital visits resulting from the original injury to give the actual length of stay and cost of stay data for each injury. Spinal cord injury codes were chosen based on Center for Disease Control and Prevention Guidelines. The discharge data presented here included all events occurring in Wisconsin during 1990-1994 to Wisconsin residents only. Non-residents of Wisconsin were not included.

Readers are encouraged to review the entire report and tables before drawing any conclusions from one table or graph within the document. Please contact the Office for Persons with Physical Disabilities for further explanation of the data presented in this report or for additional copies.

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Registry Background

Background

The Wisconsin Council on Physical Disabilities state plan and Council on Physical Disabilities 1993-1995 Biennial Budget Initiatives identified the need for the systematic collection and analysis of data. The high cost of treating disabilities, the savings in human suffering, and the cost-effectiveness of prevention are viable reasons for promoting prevention programs.

Physical injury is costly. The National Safety Council (1989) estimated that in the United States:

drinking is indicated as a factor in at least half of the fatal motor vehicle accidents;

in 40% of motorcycle fatalities, there was a detectable blood alcohol level.

the total lack of crash protection afforded by motorcycles places the motorcyclist at an 80-90% risk of death or injury in any accident;

in six states where helmet laws were required, head injury in helmeted riders was reduced by at least 60%; and

trauma accidents involving the spinal cord have their highest incidence among adolescents.

Current Concerns

The Council identified the need for information about disability etiology, including spinal cord and brain injury, suggesting that a comprehensive program of public education could serve to educate people about specific precautions and thus reduce the incidence of injury. Specific measures such as driving practices, crash helmets, and seat belts and subsequent public awareness programs that focus on youth could have significant influence on reducing such injuries. Knowledge about the etiology of injuries also suggests that a comprehensive public information program must be coordinated with other public and private agencies that also have a significant responsibility for disabilities prevention and related issues.

In 1994 the Wisconsin Council on Physical Disabilities received a planning grant from the Wisconsin Council on Developmental Disabilities to identify opportunities to establish spinal cord injury and brain trauma surveillance. The Office for Persons with Physical Disabilities staff worked with the Council to identify potential funding opportunities.

Spinal Cord Injury Surveillance

In 1995 the Medical College of Wisconsin received a five-year grant from the National Institute on Disability and Rehabilitation Research, Department of Education to become a federally designated Model Spinal Cord Injury Center. As an integral component of the grant, the Department of Health and Family Services, Office for Persons with Physical Disabilities received a subcontract to establish spinal cord injury surveillance. This surveillance has begun to compile statewide data about persons who have sustained spinal cord injuries. This data will enable other investigators to design and implement prevention projects and service projects, which will assist individuals with spinal cord injuries to live at their maximum levels of independence in their communities.

The objectives of the Spinal Cord Injury Surveillance include:

- contribute to and compare Wisconsin data with the national SCI data base;
- identify and track the incidence of spinal cord injury in Wisconsin;
- provide data which will facilitate the development and implementation of effective preventive programs;
- provide data which will facilitate blending the prevention and service aspects of health care for the population with SCI; and
- identify and track the expenditure of treatment and service dollars for persons who are spinal cord injured.

Data Sources

Surveillance opportunities in Wisconsin for injuries, illnesses, and other conditions have increased since the creation of the Office of Health Care Information (OHCI) hospital discharge data system.

The 1987 Wisconsin Act 399 established an Office of Health Care Information. OHCI's responsibilities include collecting, analyzing, and disseminating information on health care from inpatient hospital medical records. Under the statute and administrative rules, hospitals are required to submit specific data to OHCI for the purpose of constructing an inpatient hospital database, using information currently being collected on the Uniform Billing forms (UB-92). Along with a patient's billing information, the diagnosis and treatment of the patient are recorded using standard International Classification of Disease-9th Revision-Clinical Modification (ICD-9-CM) codes. OHCI, at present, collects one principal diagnostic code and has the capability of collecting up to four secondary codes.

Hospitals reporting spinal cord injuries from 1990 to 1994 are shown in **Table 1.7** and the codings used are shown in **Table 1.5**.

The case definition used for this analysis is consistent with current Centers for Disease Control (CDC) guidelines for spinal cord injury surveillance. Included are the hospital discharge records that contain one or more of the following injury codes, which are based on the ICD-9-CM.

Spinal Cord Injury

| <u>Code</u> | <u>Description</u> |
|-------------|--|
| 806 | Fracture of vertebral column with spinal cord lesion |
| 952 | Spinal cord lesion with evidence of spinal bone injury |

[This report does not include persons with spinal cord injuries who died before reaching a hospital.]

When OHCI began collecting data in January 1989, external cause codes (E-codes) for injuries were reported on a voluntary basis, as one of the four secondary diagnoses. Regardless of how many diagnostic codes were collected at individual hospitals, OHCI only analyzes five diagnostic codes. With recent revisions, the OHCI database is able to collect additional secondary diagnoses and provide a field reserved for E-codes. With the national recommendation to change the UB-82 form to the UB-92 form, a designated field is now used for the E-code. The E-codes are shown in **Table 1.8**.

External cause codes for injuries were reported on a voluntary basis until January 1994. Using the voluntary system, only 30 percent of injury diagnoses contained this data element. The inclusion of E-codes and improvement in their reporting is especially important to the

surveillance plan, as these codes classify causative agents and/or activities for disabling injuries. The E-codes provide crucial information to guide, develop and evaluate interventions, as well as initiate preventative activities. Effective January 1994, Wisconsin hospitals were required to report E-codes.

In the early years of hospital data collection, documentation and collection of race codes was not mandatory, therefore the race of some patients from 1990-1994 is “unknown” or documented as “other”.

Data Security

The Spinal Cord Registry maintains confidential data on individuals. This data is only accessible to the individual subject of the data and persons who work directly on the registry. Measures to retain patient confidentiality are outlined in Wisconsin Statutes Chapter 153.45 (Release of Data) and 153.50 (Protection of Patient Confidentiality). Only summary data are accessible to the public to protect individual identities.

All data is protected electronically through password measures, and copies of the data on backup diskettes are kept under lock and key. Any additional information collected from persons with spinal cord injuries (in the form of interviews, phone contact, etc.), for the purposes of prevention and services, will be conducted by persons under the direct supervision of the Director of the Office for Persons with Physical Disabilities.

Other Security

In addition to data password protection, an automatic virus-checking program has been installed on the registry computer in order to safeguard against the possibility of any form of virus infecting the data.

Data Quality

As stated in the introduction, while analyzing the data, questions arose relevant to the validity of coding by hospitals of actual spinal cord injuries resulting in permanent neurological deficit necessitating an inpatient rehabilitation stay. In a recent article in the American Journal of Epidemiology, Vol. 146, pp 266-272, 1997, Johnson et al. raised the issue of accuracy in reporting of spinal cord injury to a statewide database in Colorado. They report a positive predictive value of 0.55, which implies that one can be only 55% certain that an identified case of spinal cord injury is, in fact, a spinal cord injury resulting in permanent neurological deficit. This has obvious impact on the surveillance aspects of any registry that is planning on recording only spinal cord injuries with permanent neurological deficit. It is important to remember that the Center for Disease Control only requires a code of 806 or 952 for its registry. While full medical

chart review of all reported cases would not be feasible due to reasons of cost, time and confidentiality, an attempt is underway to screen the data using the available codes by using a process developed by the Medical College of Wisconsin Model Spinal Cord Injury Center. Diagnoses critical to spinal cord injury including acute paraplegia or tetraplegia, bowel and bladder paralysis and systemic problems typically associated with spinal cord injury were reviewed. Also incorporated in the determination of acuity was the performance of surgery for decompression or stabilization of the spine, placement of a halo, and transfer into a rehabilitation environment. Lengths of stay and outcome data were also considered: if patient demonstrated transient quadriparesis, or was discharged home after one day of inpatient hospital care, it was clear that this was not a permanent neurological deficit. In addition there was the need to verify this process by comparing the results with actual medical records. Several of the coding sheets were compared to the medical records of patients who had been discharged from Froedtert Hospital. Eighty-six percent of the determinations at Froedtert were found to be correct, thereby establishing the validity of the coding by that hospital.

Wisconsin's Population

Tables 1.1 and **1.2** summarize Wisconsin's population by county of residence, age and gender. From the 1990 census data, Wisconsin's population was approximately 49 percent male and 51 percent female. The largest population age groups for both males and females were in the 16-30 and 31-45 age categories, both comprising 23% of the general population. Ages 0-15 (22%), 46-60 (14%), and 61-75 (12%), followed. Those aged 75 and older made up the smallest age group, comprising 6% of the general population (Wisconsin Department of Administration, 1998).

In terms of racial diversity in 1990, 92.2 percent of Wisconsin's population was white, 5 percent black, 1.1 percent Asian or Pacific Islander, 0.8 percent American Indian, and 0.9 percent representing other racial groups. In terms of the data used in this report, some of the identifying race information was not collected when the patient was admitted to the hospital in 1990, but the trend in following years was to identify this data at time of hospital admission.

| Table 1.1 Wisconsin Population Projections / County Projections by Total Population | | | |
|--|-------------|-------------|-------------|
| County | County Name | 1990 Census | 1995 Census |
| 01 | Adams | 15,682 | 17,494 |
| 02 | Ashland | 16,307 | 16,440 |
| 03 | Barron | 40,750 | 42,087 |
| 04 | Bayfield | 14,008 | 14,557 |
| 05 | Brown | 195,594 | 206,672 |
| 06 | Buffalo | 13,584 | 13,679 |
| 07 | Burnett | 13,084 | 13,640 |
| 08 | Calumet | 34,291 | 35,689 |
| 09 | Chippewa | 52,360 | 53,490 |
| 10 | Clark | 31,647 | 32,216 |
| 11 | Columbia | 45,088 | 47,168 |
| 12 | Crawford | 15,940 | 16,154 |
| 13 | Dane | 367,085 | 393,236 |
| 14 | Dodge | 76,559 | 80,197 |
| 15 | Door | 25,690 | 26,525 |
| 16 | Douglas | 41,758 | 42,007 |
| 17 | Dunn | 35,909 | 37,001 |
| 18 | Eau Claire | 85,183 | 88,374 |
| 19 | Florence | 4,590 | 5,211 |
| 20 | Fond du Lac | 90,083 | 92,167 |
| 21 | Forest | 8,776 | 8,980 |
| 22 | Grant | 49,266 | 50,286 |
| 23 | Green | 30,339 | 30,593 |
| 24 | Green Lake | 18,651 | 19,134 |
| 25 | Iowa | 20,150 | 20,804 |
| 26 | Iron | 6,153 | 6,400 |
| 27 | Jackson | 16,588 | 17,122 |
| 28 | Jefferson | 67,783 | 70,799 |
| 29 | Juneau | 21,650 | 22,798 |
| 30 | Kenosha | 128,181 | 138,313 |
| 31 | Kewaunee | 18,878 | 19,184 |
| 32 | LaCrosse | 97,904 | 101,596 |
| 33 | Lafayette | 16,074 | 16,200 |
| 34 | Langlade | 19,505 | 20,300 |
| 35 | Lincoln | 26,993 | 28,243 |
| 36 | Manitowoc | 80,421 | 82,615 |
| 37 | Marathon | 115,400 | 120,634 |
| 38 | Marinette | 40,548 | 41,837 |
| 39 | Marquette | 12,321 | 13,334 |
| 40 | Menominee | 3,890 | 4,275 |

| County | County Name | 1990 Census | 1995 Census |
|---------------------|--------------------|--------------------|--------------------|
| 41 | Milwaukee | 959,275 | 982,097 |
| 42 | Monroe | 36,633 | 38,343 |
| 43 | Oconto | 30,226 | 31,594 |
| 44 | Oneida | 31,679 | 33,563 |
| 45 | Outagamie | 140,510 | 149,583 |
| 46 | Ozaukee | 72,831 | 79,894 |
| 47 | Pepin | 7,107 | 7,115 |
| 48 | Pierce | 32,765 | 34,209 |
| 49 | Polk | 34,773 | 36,028 |
| 50 | Portage | 61,405 | 64,766 |
| 51 | Price | 15,600 | 15,668 |
| 52 | Racine | 175,034 | 180,941 |
| 53 | Richland | 17,521 | 17,867 |
| 54 | Rock | 139,510 | 143,043 |
| 55 | Rusk | 15,079 | 15,295 |
| 56 | St. Croix | 50,251 | 54,282 |
| 57 | Sauk | 46,975 | 50,607 |
| 58 | Sawyer | 14,181 | 15,000 |
| 59 | Shawano | 37,157 | 38,012 |
| 60 | Sheboygan | 103,877 | 106,179 |
| 61 | Taylor | 18,901 | 19,325 |
| 62 | Trempealeau | 25,263 | 25,816 |
| 63 | Vernon | 25,617 | 26,259 |
| 64 | Vilas | 17,707 | 18,987 |
| 65 | Walworth | 75,000 | 80,900 |
| 66 | Washburn | 13,772 | 14,506 |
| 67 | Washington | 95,328 | 109,317 |
| 68 | Waukesha | 304,715 | 336,025 |
| 69 | Waupaca | 46,104 | 49,105 |
| 70 | Waushara | 19,385 | 20,192 |
| 71 | Winnebago | 140,320 | 146,976 |
| 72 | Wood | 73,605 | 76,026 |
| State Totals | | 4,891,769 | 5,124, 971 |

| Table 1.2 Wisconsin Population Projections By Age Group | | |
|--|------------------|------------------|
| Age Group | 1990 Census | 1995 Census |
| 0-15 | 1,093,891 | 1,144,151 |
| 16-30 | 1,113,755 | 1,064,850 |
| 31-45 | 1,143,869 | 1,224,285 |
| 45-60 | 681,112 | 814,583 |
| 61-75 | 567,552 | 560,357 |
| 75+ | 291,590 | 316,745 |
| Totals | 4,891,769 | 5,124,971 |

Glossary of Terms

Central Nervous System (CNS): the brain, spinal cord, and retina.

Cervical Spine: highest level in the spine, the neck region, consisting of seven vertebrae and eight nerve roots.

Clinic Referral: the patient was admitted to a facility upon recommendation of a clinic physician.

Coccyx: the tailbone, with one vertebrae and nerve root.

Complete Injury: injury that leaves no motor function or sensation below the spinal cord injury zone.

Court/Law Enforcement Referral: the patient was admitted to a facility upon direction of a court of law, upon the request of a law enforcement agency representative, or upon referral from a 51.42/51.437 or 46.23 county board.

Elective Admission: an admission that can be delayed without substantial risk to the health of the individual. This means the patient's condition permits adequate time to schedule the availability of a suitable accommodation.

Emergency Admission: the patient requires immediate medical intervention as a result of severe, life threatening or potentially disabling conditions. Usually the patient is admitted through the emergency room.

Emergency Referral: the patient was admitted to a facility upon recommendation of an emergency room physician.

HMO Referral: the patient was referred to a facility upon the recommendation of a health maintenance organization physician.

Incomplete Injury: spinal cord damage leaving some sensation and/or motor control below the injury zone because some nerve pathways remain intact.

Level of Injury: level of injury is determined by which vertebrae of the spinal cord has been injured. The closer the injury is to the brain, the greater the loss of function and feeling will be. C3-T1 will produce tetraplegia. T1 and below will produce paraplegia; C5 and above will produce tetraplegia with reduced respiratory function.

Lumbar Spine: the strongest part of the spine, the lower back, consisting of five vertebrae and nerve roots.

Paraplegia: loss of function below the cervical spinal cord segments, upper body usually retains most function and sensation.

Physician Referral: the patient was admitted to a facility upon the recommendation of his or her physician.

Tetraplegia (formerly quadraplegia): loss of function of any injured or diseased cervical spinal cord segment, affecting all four limbs.

Transfer from Another Health Care Facility: the patient was admitted to a facility as a transfer from a health care facility other than an acute care facility or a skilled nursing facility.

Transfer from a Hospital: the patient was admitted to a facility as a transfer from an acute care facility where he or she was an inpatient.

Transfer from a Skilled Nursing Facility: the patient was admitted to a facility as a transfer from a skilled nursing facility where he or she was and inpatient.

Sacrum Spine: below the lumbar spine, with five vertebrae and nerve roots.

Spinal Cord Injury: any injury of the neural elements within the spinal canal. Can occur from either trauma or disease.

Thoracic Spine: at the level of the chest, has twelve vertebrae and nerve roots.

Urgent Admission: the patient requires immediate attention for the care and treatment of a physical or mental disorder. Generally the patient is admitted to the first available and suitable accommodation.

Ventilator: a mechanical apparatus or machine, which is used for artificially ventilating the lungs.

Introduction to Spinal Cord Injury

The spinal cord is part of the nervous system and is the largest nerve in the body. It is about 18 inches long and extends from the base of the brain, down the middle of the back, to about the waist and is surrounded by protective rings of bone called the vertebral column, or the spinal column. The 33 vertebrae of the spine can be divided into several regions. At the highest level in the spine, the neck region is the cervical spine, consisting of seven vertebrae and eight nerve roots. They are smaller than the other vertebrae, which allows a greater amount of movement. The thoracic spine, at the level of the chest, has twelve vertebrae and nerve roots. The spinal canal in the thoracic region is relatively smaller than the cervical or lumbar areas. This makes the thoracic spinal cord at greater risk if there is a fracture (Maddox, 1993).

Below the thoracic spine is the lumbar spine, the low back region, consisting of five vertebrae and nerve roots and then the sacrum, which also has five fused vertebrae and nerve roots. The coccyx, or tailbone, has one vertebrae and nerve root. Vertebrae increase in size as they go down the column, with the cervical as the smallest and the lumbar the largest.

The *central nervous system* consists of the brain and spinal cord. The nerves that lie within the spinal cord are upper motor neurons and their function is to carry the messages back and forth from the brain to the spinal nerves along the spinal tract. The *peripheral nervous system* consists of spinal nerves that branch out from the spinal cord to other parts of the body, that are called lower motor neurons. These spinal nerves exit and enter at each vertebral level and communicate with specific areas of the body. The *sympathetic nervous system* is a system of nerves that controls involuntary functions such as blood pressure and temperature regulation.

The term *spinal cord injury* or SCI refers to any injury of the neural elements within the spinal column. SCI can occur from either trauma or disease to the vertebral column or the spinal cord itself, though most spinal cord injuries are the result of trauma to the vertebral column. The spinal cord does not have to be severed in order for a loss of functioning to occur. In fact, in most people with SCI, the spinal cord is intact, but the damage to it results in loss of functioning due to bruising or loss of blood supply. These injuries can affect the spinal cord's ability to send and receive messages from the brain to the body systems that control the sensory, motor, and autonomic function below the level of injury.

Typically, the nerves above the injury site continue to function as they always have and the nerves below the site do not. A physician describes an individual as having a certain “level” injury by naming the region affected and the level that corresponds with that region. In general, the higher the level of injury, the greater the functional loss. Damage to the cervical region (C1-C8) usually results in a loss of function in the arms and legs, resulting in tetraplegia. Injury to the thoracic region (T1-T12) usually affects the chest and legs and results in paraplegia. Nationally, the most common types of injury are at the mid-to-low cervical vertebrae (C5-C6), followed by the thoracolumbar junction (T2-L1). Both spots are the spine’s areas of greatest flexibility and vulnerability.

Mortality rates are significantly higher during the first year after injury than during subsequent years. The average life expectancy for a person with spinal cord injury continues to increase due to improved technology, but is still somewhat below normal. Spinal cord injuries have profound effects on the public health system because of the young age of those injured, the high cost of acute and rehabilitative care, and the long-term disability.



Executive Summary

Incidence of Spinal Cord Injury

Hospitalization and Cost Information

Circumstances of Spinal Cord Injury

Status at Time of Discharge

Spinal Cord Injury Rates by County of Residence

Executive Summary

From 1990 to 1994, there were 945 spinal cord injury events in Wisconsin with the predominant causes of hospitalizations being motor vehicle crashes, falls, and other injury events. Males disproportionately represented 73% of spinal cord injuries. In Wisconsin, the average age at time of injury was 40.7 (males 38.9 and females 45.5), with the most frequent age at 21 (males 21 and females 25). Males aged 16-30 represented the overall largest group of injury with 281 (30% overall), followed by men in the 31-45 age group with 173 (18% overall). Females aged 16-30 represented the largest group for women with 76 (8% overall) injuries, followed by women aged 31-45 with 52 (5% overall) injuries. Overall, 38% of all injuries (both men and women) occurred between the ages of 16-30. It is interesting to note that 23% of all injuries occurred to individuals who were age 61 or over. This is especially significant with women, as over 35% of all injuries occur to women in that combined age group. Although age and gender are significant risk factors for spinal cord injury, there are other risk factors that contribute such as race, time of year and demographic area.

The majority of individuals admitted for spinal cord injuries during 1990-1994 were white (696 or 74%), followed by 73 (or 8%) being black. Although whites sustain the majority of spinal cord injuries, members of minority groups sustain a disproportionate percentage relative to their numbers.

The warmest months (June through October) had the highest number of spinal cord injury events, with July and September being the leading months. Saturday and Sunday had the highest incidence of spinal cord injuries. It is important to remember that Saturday and Sunday would include any incidences that occurred the "night" before (after midnight). For example, Saturday injuries would include any incidence that occurred after midnight on Friday.

The average length of an inpatient hospital stay from 1990-1994 ranged from 35.2 days in 1990 to 35.9 days in 1994, with an average of 37.9 days. During the five years, over 35,818 days – the equivalent of 98 years – were spent in acute care hospitals by Wisconsin's 945 spinal cord injury survivors. From 1990-1994, acute care hospital charges for treatment for spinal cord injuries totaled more than \$11 million per year. The average charge for a non-fatal spinal cord injury was \$66,642 per year.

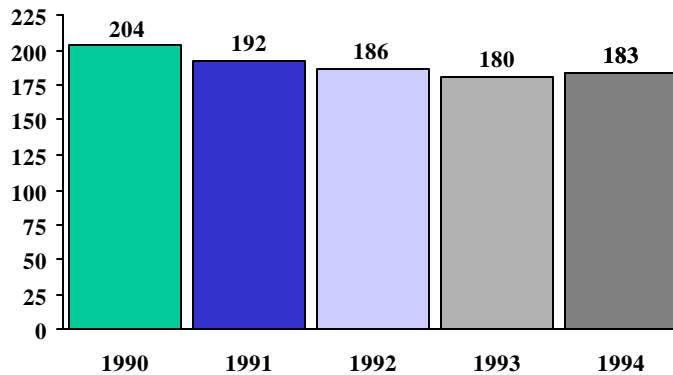
Spinal cord injuries have profound effects on the public health system because of the young age of those injured, the high cost of acute and rehabilitative care, and the long-term disability. Thus, the findings of this and future registries will identify the cost and cause of spinal cord injury, leading to strategies to prevent the injuries from occurring in the first place.

Spinal Cord Injury Events: 1990—1994

The Incidence of Spinal Cord Injury

From January 1, 1990 to December 31, 1994, a total of 945 Wisconsin residents were hospitalized for a spinal cord injury. In 1990, the first year of data for this report, there was a total of 204 injuries, and in 1994, a total of 183 injuries. There was an average of 189 injuries per year. Over the five year period, there was a decrease of an average of four spinal cord injuries yearly (**Graph 1.1**).

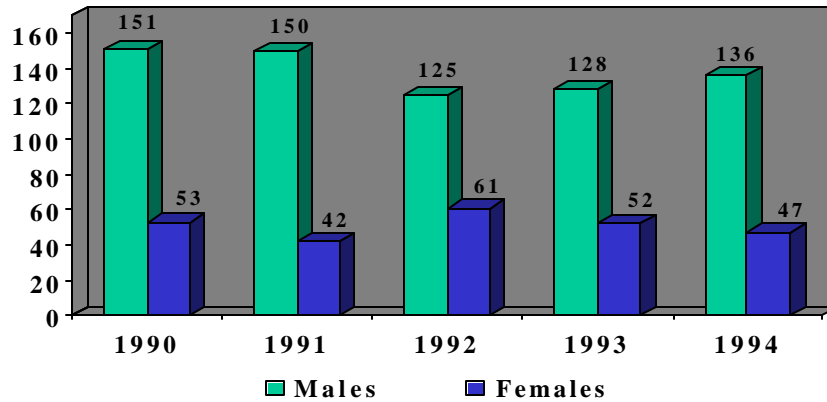
Graph 1.1
Incidence of Spinal Cord Injuries
1990-1994



Demographics

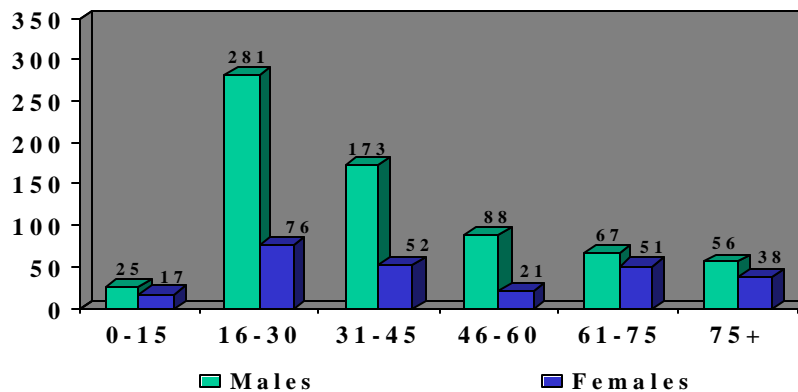
Sex—From 1990-1994, males sustained 690 injuries (73%) and females sustained 255 injuries (27%) (**Graph 1.2**). These percentages did not fluctuate greatly through the years, except for 1991 when males sustained 78% of injuries (females 22%), and 1992 when males sustained 67% of injuries (females 33%).

Graph 1.2
Injuries by Gender and Year
1990-1994



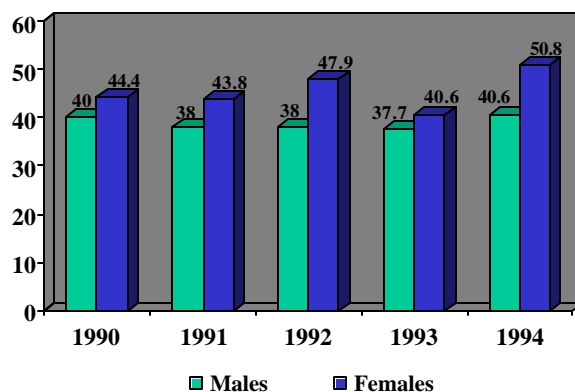
Age—In the Wisconsin 1990-1994 data, the average age at time of injury was 40.7. The most frequent age of injury was 21 overall, with 21 for males and 25 for females. The mean age at injury was slightly higher for females (45.5) than for males (38.9). Ages ranged from 2 to 96. Males aged 16-30 represented the overall largest group of injury (281), followed by men in the 31-45 age group (173). Females aged 16-30 represented the largest group of women with 76 injuries, followed by women aged 31-45 with 52 injuries (**Graph 1.3**).

Graph 1.3
Injuries by Age and Gender
1990 - 1994



There was a slight increase in the mean age of injury for both males and females through the five year period (**Graph 1.4**).

Graph 1.4
Average Age by Year and Gender
1990-1994



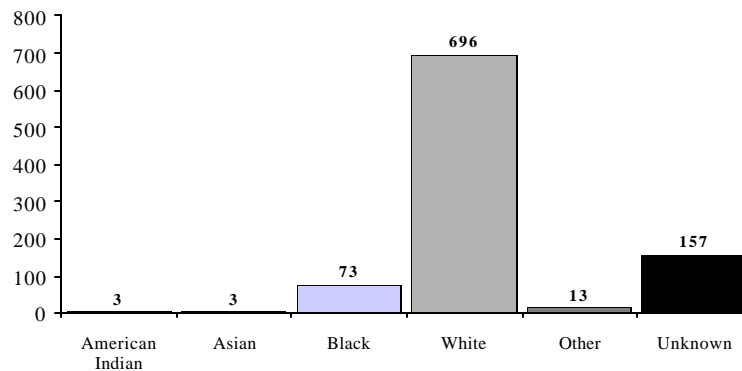
Overall, 38% of all injuries occurred between the ages of 16-30. The next highest age group was 31-45, with 24% of all injuries. Twelve percent occurred between the ages of 46-60 and 61-75, followed by 10% of persons aged 75 and older. Finally, 4% of all injuries occurred between the ages of 0-15. Overall, 38% of all injuries occurred to individuals who were age 61 or over. The number of injuries in this age group increased by 17% over the five-year period. This is especially significant with women, as over 35% of all injuries occurred to women in that combined age group. These numbers are significant because older persons who incur spinal cord injuries tend to have more pre-existing medical conditions and are more likely to sustain an injury resulting in tetraplegia, develop secondary medical complications during acute care and rehabilitation, and have more frequent hospitalizations than their younger counterparts. The total number of spinal cord injuries for each age group and gender is listed in **Table 1.4**.

Among racial/ethnic groups, whites had the highest mean age at injury (41.5 years), while Asians had the lowest mean age at injury (21.7 years). The mean age at injury for Native Americans was 37.0 years, while for blacks it was 33.0 years.

Ethnicity—In the early years of hospital data collection, documentation and collection of race information was not mandatory, therefore the race of some patients from 1990-1994 is unknown (157 or 16%), or documented as “other” (13 or 1%). The majority of individuals admitted for spinal cord injuries during 1990-1994 were white (696 or 74%), followed by 73 or 8% being black (**Graph 1.5**). Although whites sustained the majority of spinal cord injuries, members of minority groups did sustain a disproportionate percentage relative to their numbers in Wisconsin.

In fact, 5% of the Wisconsin population is black, yet this group sustained 8% of all spinal cord injuries in Wisconsin. In addition, there was a steady increase in the incidence of spinal cord injuries among blacks from 1990-1993. The rate of injuries among other racial/ethnic groups remained the same throughout the five-year period.

Graph 1.5
Injuries by Race
1990-1994

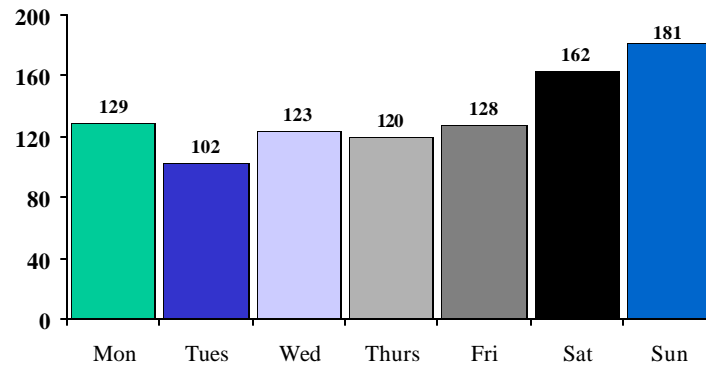


Among blacks, men were twice as likely to acquire spinal cord injuries than females, while among whites, males were three times as likely to acquire spinal cord injuries than females.

Hospitalization and Cost Information

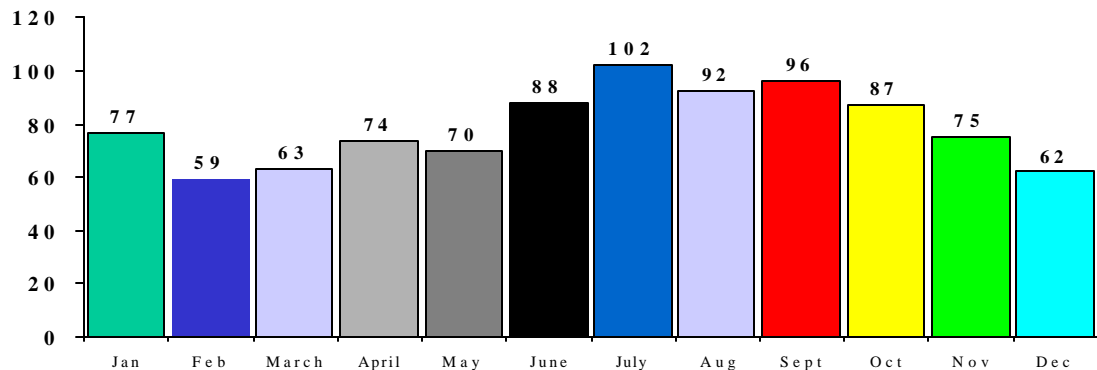
Admission Day, Month, Type and Source—In 1990-1994, the majority of spinal cord injury events occurred during the weekend. Sundays had the highest number of events, but it is important to remember that any admission occurring after midnight on Saturday would be counted as a Sunday admission. This would account for the high number of injuries on Sundays. Tuesdays had the lowest number of injury events (**Graph 1.6**).

Graph 1.6
Admission by Day of the Week
1990-1994



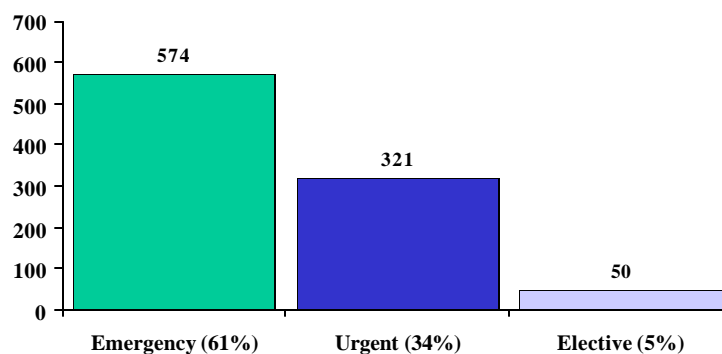
In terms of the month in which individuals were admitted to hospitals in Wisconsin for spinal cord injuries, the months of June through October had the highest number of injuries. Overall, July had the highest number of admissions with 102, followed by September with 96. February had the lowest amount with 59 (**Graph 1.7**). If race becomes a variable, blacks had the highest incidence of injury in October and November.

Graph 1.7
Admission by Month
1990-1994



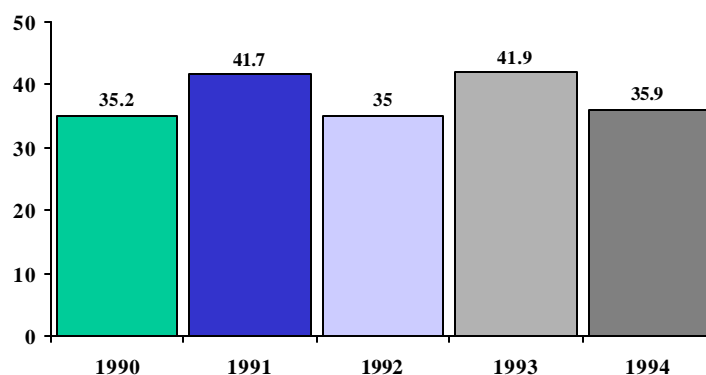
Both the largest type and source of admission to hospitals involving residents with spinal cord injuries occurred during emergency situations, where the patient required immediate medical intervention as a result of severe, life threatening or potentially disabling conditions (**Graph 1.8**).

Graph 1.8
Type of Admission
1990-1994



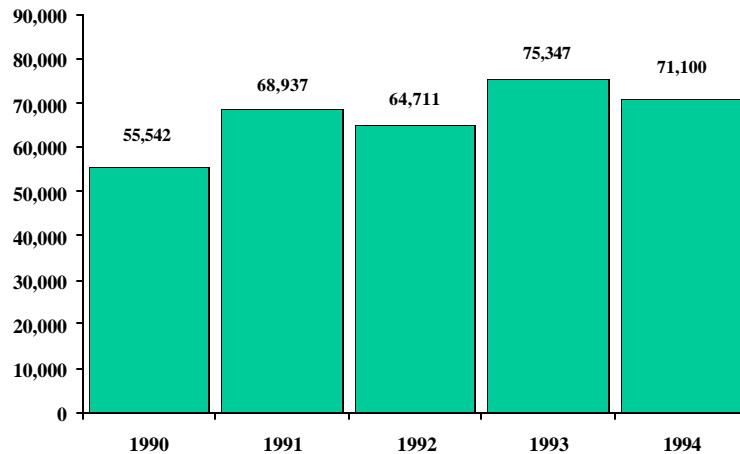
Length of Inpatient Stay—The average length of hospital stay from 1990-1994 ranged from 35.2 days in 1990, to 35.9 days in 1994 (**Graph 1.9**). During the five years, over 35,818 days—the equivalent of 98 years—were spent in acute care hospitals by Wisconsin’s 945 spinal cord injury survivors. During the time period, acute initial hospital stays ranged from 1 to 471 days. The average length of stay for men was 39.9 days, for women 32.3 days. The level and severity of the injury, as well as other injuries, complications and surgical interventions contributed to this wide variation. For instance, the average length of stay for a tetraplegia injury was 40.7 days and for a paraplegia injury, 31.9 days. Above all factors, respiratory complications, including ventilator dependency, were responsible for lengthy hospital stays.

Graph 1.9
Average Length of Inpatient Stay
1990-1994



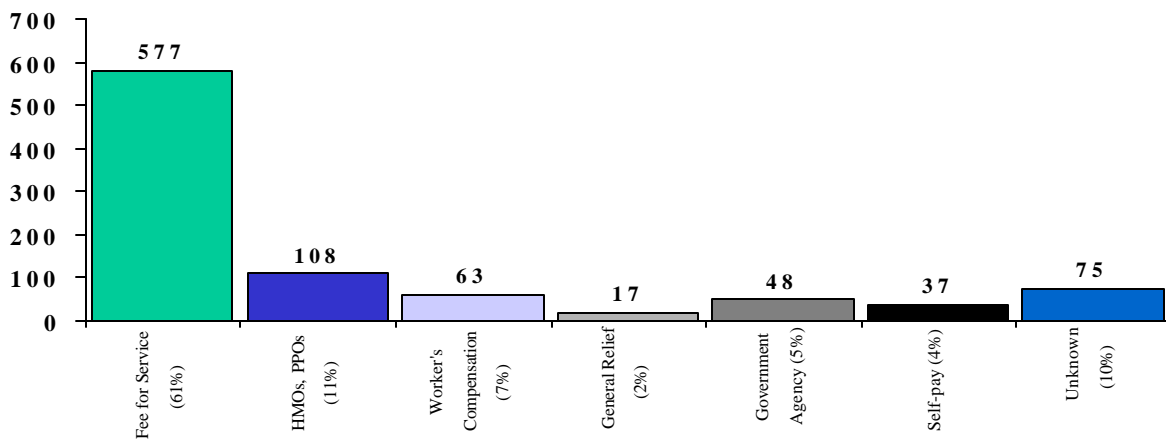
Cost of Inpatient Hospital Care—From 1990-1994, acute care hospital charges for treatment of spinal cord injury totaled more than \$11 million a year. In relation to the time spent in the hospital, the total costs for those stays fluctuated between 1990 and 1994. In 1990, the average cost for a hospital stay was \$55,542. In 1994 the average was \$71,100 (**Graph 1.10**). This is an increase of 28%. In terms of gender differences, the cost of hospitalization was greater for males than females during all five years. Males averaged \$72,096 per year, females averaged \$52,667 per year. Men averaged almost eight more days of acute care, which may account for the difference in average costs. Over the five-year period, the cost of inpatient care for males increased 32% (an average of \$3800 a year), and the cost of care for females increased 12% (an average of \$1000 a year). In addition to lengthier stays, males tended to sustain more severe injuries. Fifty-five percent of all injuries to males resulted in tetraplegia, while just 52% of injuries to females resulted in a tetraplegia diagnosis. It is important to remember that these costs do not reflect the total cost for a spinal cord injury, since medical equipment, ongoing medical care, home and vehicle modifications, and attendant care greatly add to the overall costs of spinal cord injuries.

Graph 1.10
Average Cost of Inpatient Hospital Care
1990-1994



Payer Type—From 1990-1994, the majority of initial inpatient stays (577 or 61%) were paid for by fee-for service insurance. One hundred and eight (11%) initial inpatient stays were paid for by an Alternative Health Care Insurance Plan (HMO, PPO, PPA, etc.). Other payment types included worker's compensation (63 or 7%), general relief (17 or 2%), other government agency or program (48 or 5%), and self-pay (37 or 4%). For ninety-four (10%) inpatient stays, the exact type of payment, either fee-for-service or HMO was unable to be determined (**Graph 1.11**). These payer types did not fluctuate greatly from year to year.

Graph 1.11
Payer Type
1990 - 1994

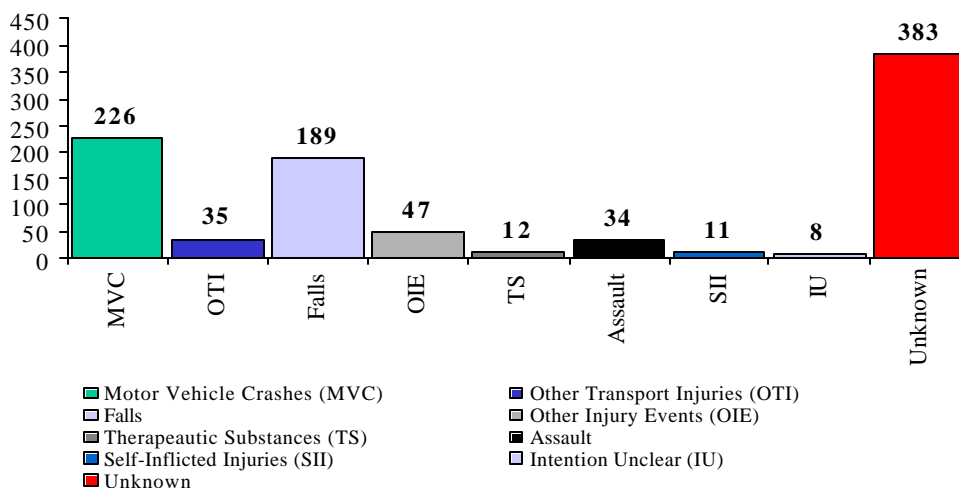


Primary and Secondary Payer— Medicare was the primary payer for 175 initial inpatient stays; Medicaid for 94 stays. Medicare was the secondary payer for 35 initial hospital stays; Medicaid for 58. These payers did not fluctuate greatly from year to year.

Circumstances of Spinal Cord Injury

Causes of Injury—Based on the available information from E-Codes (there were 565 injury events with E-codes listed), the leading cause of spinal cord injury during 1990-1994 was motor vehicle crashes (226), followed by accidental falls (189), and then other injury events (47). After age 46, the leading cause of injury was due to some type of fall (**Graph 1.12**). Causes of spinal cord injury can vary by race. Motor vehicle crashes were the leading cause among whites (182), followed by falls (158). Intentional injuries (assault and self-inflicted) were the leading cause of spinal cord injury among blacks (27), followed by falls (13). In fact, intentional injuries were the cause of 39% of all spinal cord injuries among blacks.

Graph 1.12
Causes of Injury 1990 - 1994



The leading causes of injuries of spinal cord injuries from 1990 through 1994 are listed in **Table 1.3**.

Table 1.3
Causes of SCI, by Gender: 1990-1994

| <i>Cause (with E-code)</i> | <i>Male #</i> | <i>Male %</i> | <i>Female #</i> | <i>Female %</i> | <i>Total #</i> | <i>Total %</i> |
|--|-------------------|-------------------|---------------------|---------------------|--------------------|--------------------|
| <u>Unintentional</u> | | | | | | |
| Motor Vehicle Crashes (810-819, 929.0) | 162 | 39 | 64 | 44 | 226 | 40 |
| Other Transport Injuries (820-848, 929.1) | 26 | 6 | 9 | 6 | 35 | 6 |
| Falls (880-888, 929.3) | 141 | 34 | 48 | 33 | 189 | 34 |
| Other Injury Events (870-879, 916-928) | 37 | 9 | 10 | 7 | 47 | 9 |
| Therapeutic Substances (930-949) | 10 | 2 | 2 | 1 | 12 | 2 |
| <u>Intentional</u> | | | | | | |
| Assault (960-969) | 27 | 7 | 7 | 5 | 34 | 6 |
| Self-inflicted Injuries (950-959) | 6 | 1.5 | 5 | 3 | 11 | 2 |
| <u>Unclear</u> | | | | | | |
| Intention Unclear (980-989) | 6 | 1.5 | 2 | 1 | 8 | 1 |
| <u>Total With Cause Known</u> | 415 | 100 | 147 | 100 | 562 | 100 |
| | | | | | | |
| <u>Unknown</u> | | | | | | |
| Unknown (no E-code) | 275 | | 108 | | 383 | |
| <u>Total SCI</u> | 690 | | 255 | | 945 | |

Table 1.4
Causes of SCI by Selected Age Groups: 1990-1994

| <i>Age Groups & Causes</i> | <i>Male</i> | | <i>Female</i> | | <i>Total</i> | |
|--------------------------------|---------------------------------|----------|---------------------------------|----------|---------------------------------|----------|
| | <i>Number of SCI Events</i> | <i>%</i> | <i>Number of SCI Events</i> | <i>%</i> | <i>Number of SCI Events</i> | <i>%</i> |
| 0-15 | | | | | | |
| Total All Causes | 25 | 100 | 17 | 100 | 42 | 100 |
| Motor Vehicle Crashes | 5 | 20 | 4 | 23 | 9 | 21 |
| Other Transport Injuries | 1 | 4 | 1 | 6 | 2 | 5 |
| Falls | 5 | 20 | 2 | 12 | 7 | 17 |
| Other Injury Events | 1 | 4 | 3 | 18 | 4 | 10 |
| Therapeutic Substances | 0 | 0 | 0 | 0 | 0 | 0 |
| Assaults | 2 | 8 | 1 | 6 | 3 | 7 |
| Self-inflicted Injuries | 0 | 0 | 0 | 0 | 0 | 0 |
| Intention Unclear | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown | 11 | 44 | 6 | 35 | 17 | 40 |
| 16-30 | | | | | | |
| Total All Causes | 281 | 100 | 76 | 100 | 357 | 100 |
| Motor Vehicle Crashes | 77 | 27 | 26 | 34 | 103 | 29 |
| Other Transport Injuries | 18 | 6 | 4 | 5 | 22 | 6 |
| Falls | 39 | 14 | 7 | 9 | 46 | 13 |
| Other Injury Events | 19 | 7 | 2 | 3 | 21 | 6 |
| Therapeutic Substances | 6 | 2 | 0 | 0 | 6 | 2 |
| Assaults | 18 | 6.5 | 3 | 4 | 21 | 6 |
| Self-inflicted Injuries | 2 | 1 | 3 | 4 | 5 | 1 |
| Intention Unclear | 4 | 1.5 | 1 | 1 | 5 | 1 |
| Unknown | 98 | 35 | 30 | 40 | 128 | 36 |
| 31-45 | | | | | | |
| Total All Causes | 172 | 100 | 52 | 100 | 224 | 100 |
| Motor Vehicle Crashes | 50 | 29 | 14 | 27 | 64 | 29 |
| Other Transport Injuries | 3 | 2 | 3 | 6 | 6 | 3 |
| Falls | 41 | 24 | 9 | 17 | 50 | 22 |
| Other Injury Events | 9 | 5 | 3 | 6 | 12 | 5 |
| Therapeutic Substances | 2 | 1 | 0 | 0 | 2 | 1 |
| Assaults | 5 | 3 | 3 | 6 | 8 | 4 |
| Self-inflicted Injuries | 3 | 2 | 1 | 2 | 4 | 2 |
| Intention Unclear | 2 | 1 | 1 | 2 | 3 | 1 |
| Unknown | 57 | 33 | 18 | 34 | 75 | 33 |
| 46-60 | | | | | | |
| Total All Causes | 89 | 100 | 21 | 100 | 110 | 100 |
| Motor Vehicle Crashes | 16 | 18 | 6 | 29 | 22 | 20 |
| Other Transport Injuries | 4 | 4.5 | 0 | 0 | 4 | 4 |
| Falls | 22 | 25 | 7 | 33 | 29 | 26 |
| Other Injury Events | 3 | 3.5 | 0 | 0 | 3 | 2 |
| Therapeutic Substances | 2 | 2 | 0 | 0 | 2 | 2 |
| Assaults | 1 | 1 | 0 | 0 | 1 | 1 |
| Self-inflicted Injuries | 1 | 1 | 1 | 5 | 2 | 2 |
| Intention Unclear | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown | 40 | 45 | 7 | 33 | 47 | 43 |

(Table 1.4, Continued)

| | | | | | | |
|--------------------------|-----------|------|-----------|-----|------------|-----|
| 61-75 | | | | | | |
| Total All Causes | 67 | 100 | 51 | 100 | 118 | 100 |
| Motor Vehicle Crashes | 9 | 13.5 | 12 | 23 | 21 | 18 |
| Other Transport Injuries | 0 | 0 | 0 | 0 | 0 | 0 |
| Falls | 16 | 24 | 11 | 22 | 27 | 23 |
| Other Injury Events | 4 | 6 | 0 | 0 | 4 | 3 |
| Therapeutic Substances | 0 | 0 | 1 | 2 | 1 | 1 |
| Assaults | 1 | 1.5 | 0 | 0 | 1 | 1 |
| Self-inflicted Injuries | 0 | 0 | 0 | 0 | 0 | 0 |
| Intention Unclear | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown | 37 | 55 | 27 | 53 | 64 | 54 |
| 75+ | | | | | | |
| Total All Causes | 56 | 100 | 38 | 100 | 94 | 100 |
| Motor Vehicle Crashes | 5 | 9 | 2 | 5 | 7 | 8 |
| Other Transport Injuries | 1 | 2 | 0 | 0 | 1 | 1 |
| Falls | 18 | 32 | 12 | 32 | 30 | 32 |
| Other Injury Events | 1 | 2 | 2 | 5 | 3 | 3 |
| Therapeutic Substances | 0 | 0 | 1 | 3 | 1 | 1 |
| Assaults | 0 | 0 | 0 | 0 | 0 | 0 |
| Self-inflicted Injuries | 0 | 0 | 0 | 0 | 0 | 0 |
| Intention Unclear | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown | 31 | 55 | 21 | 55 | 52 | 55 |

Motor Vehicle Crashes—Motor vehicle crashes were by far the leading cause of spinal cord injury among Wisconsin residents. From 1990-1994, 226 spinal cord injuries (162 or 39% of injuries to males and 64 or 44% of injuries to females) were sustained in a motor vehicle crash. Overall, males sustained approximately 2.5 times as many spinal cord injury events in motor vehicle crashes as did females. Motor vehicle crashes were the leading cause of spinal cord injury for both genders between 0 to 45, and the second leading cause of injury for persons aged 46 and older.

In the majority of motor vehicle crashes (51%), the driver was the individual to sustain the spinal cord injury. Fourteen percent of motor vehicle injuries occurred to individuals while operating a motorcycle.

Falls—Falls were the second leading cause of spinal cord injury in Wisconsin. There were 189 fall events recorded in Wisconsin from 1990-1994, with seventy-five percent of those events occurring to men. Men sustained 141 spinal cord injuries due to falls, while females sustained 48 injuries. Falls were the leading cause of spinal cord injury for both genders aged 46 and older.

The majority of identified falls (53%) occurred when the individual fell from one level to another (falling down stairs, off ladders and chairs, etc.). Twenty-three (12%) of injuries were sustained from shallow water dives.

Other Injury Events—This was the third leading cause of injury, not related to transport vehicles, including machine injuries, sport injuries, and injuries incurred during medical procedures. There were 47 injuries sustained from 1990-1994 due to these events. Males sustained 37 (79%) of these injuries.

Intentional Injuries—Intentional injuries were the fourth leading cause of spinal cord injury. From 1990-1994, there were 45 intentional events resulting in spinal cord injury. Men sustained 33 (73%) of these intentional events. This total includes self-inflicted injury as well as those inflicted by other persons. The number of intentional injuries did not fluctuate greatly from year to year.

The question of intention is often considered relevant to causation. An injury is categorized as “intention unknown” when it is unspecified or it cannot be determined whether the injuries are accidental (unintentional), suicide (attempted), or assault.

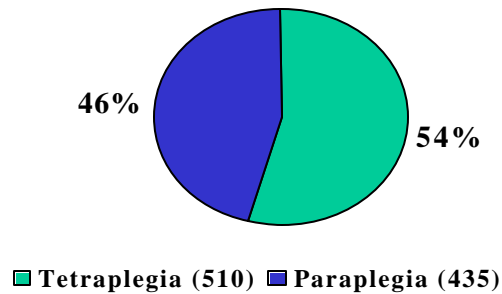
Whether ruled accidental, intentional, or intention unknown, firearms were a recurring cause of spinal cord injury, especially among males. Fifty-three firearm injury events were reported, forty-three (81%) of these to males.

Other Transport Injuries—From 1990-1994, other transport injuries were the fifth leading cause of spinal cord injury, with 35 injuries reported. Other transport injuries include injuries from snowmobiles, watercraft, and aircraft, among others. Males sustained 26 (74%) of these other transport-related events.

The majority of these injuries (12 or 34%) were sustained while operating an off-road motor vehicle (not including snowmobiles).

Level and Severity of Injury—There are two categories of spinal cord injuries: paraplegia and tetraplegia. A person is said to have paraplegia when there is a loss of feeling in the lower portion of the body. Tetraplegia is described as loss of movement in both the upper and lower portions of the body (Maddox, 1993). In the 1990 through 1994 data, 54% of the individuals sustained spinal cord injuries resulting in tetraplegia, and 46% in paraplegia (**Graph 1.13**). Men sustained 378 injuries resulting in tetraplegia and 312 injuries resulting in paraplegia. Women sustained 132 injuries resulting in tetraplegia and 123 injuries resulting in paraplegia.

Graph 1.13
Severity of Injury
1990-1994



The severity of a spinal cord injury is determined by the level of the injury and by the amount of neurological impairment. A spinal cord injury at any level may impair strength, sensation, bowel, bladder, and sexual functioning.

A spinal cord injury can also be described as either complete or incomplete. A complete injury means an individual has no function, sensation, or voluntary movement below the level of injury. In most cases, both sides are equally affected. An incomplete injury means there is some functioning below the primary level of injury. The individual may be able to move one limb more than another, feel parts of the body that cannot be moved, or may have more functioning on one side of the body than the other. Due to advances in medicine, the incomplete injury is more common.

Table 1.5

Principal Diagnosis

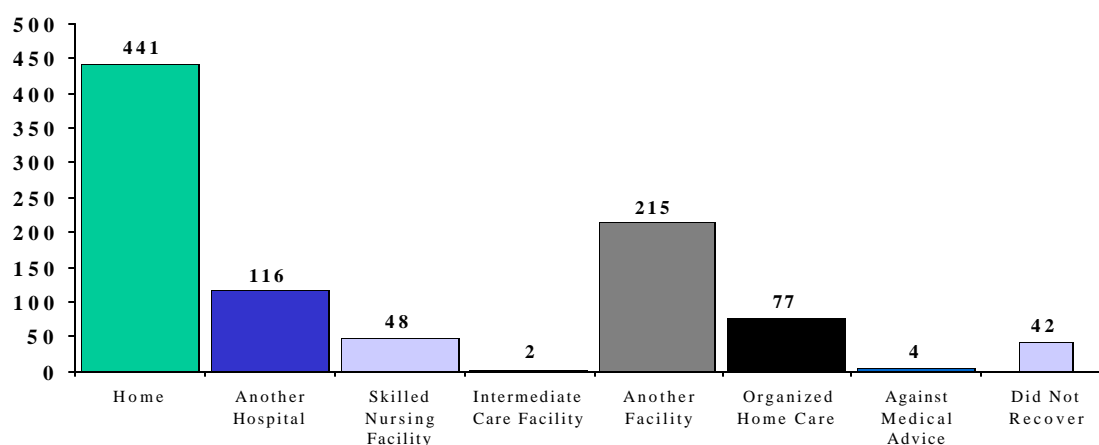
| Diagnosis Code | Principal Diagnosis | Male | Female | Total |
|----------------|---|------|--------|-------|
| 806 | Fracture of vertebral column with spinal cord injury | | | |
| 806.0 | <i>Cervical, closed</i> | | | |
| 806.00 | C1-C4 level with unspecified spinal cord injury | 35 | 13 | 48 |
| 806.01 | C1-C4 level with complete lesion of cord | 9 | 1 | 10 |
| 806.02 | C1-C4 level with anterior cord syndrome | 2 | 1 | 3 |
| 806.03 | C1-C4 level with central cord syndrome | 9 | 5 | 14 |
| 806.04 | C1-C4 level with other specified spinal cord injury | 18 | 8 | 26 |
| 806.05 | C5-C7 level with unspecified spinal cord injury | 51 | 21 | 72 |
| 806.06 | C5-C7 level with complete lesion of cord | 29 | 4 | 33 |
| 806.07 | C5-C7 level with anterior cord syndrome | 2 | 2 | 4 |
| 806.08 | C5-C7 level with central cord syndrome | 23 | 10 | 33 |
| 806.09 | C5-C7 level with other specified spinal cord injury | 34 | 9 | 43 |
| 806.1 | <i>Cervical, open</i> | | | |
| 806.14 | C1-C4 level with other specified spinal cord injury | 1 | 2 | 3 |
| 806.15 | C5-C7 level with unspecified spinal cord injury | 1 | 0 | 1 |
| 806.2 | <i>Dorsal (thoracic), closed</i> | | | |
| 806.20 | T1-T6 level with unspecified spinal cord injury | 23 | 11 | 34 |
| 806.21 | T1-T6 level with complete lesion of cord | 16 | 2 | 18 |
| 806.24 | T1-T6 level with other specified spinal cord injury | 16 | 4 | 20 |
| 806.25 | T7-T12 level with unspecified spinal cord injury | 31 | 20 | 51 |
| 806.26 | T7-T12 level with complete lesion of cord | 28 | 2 | 30 |
| 806.27 | T7-T12 level with anterior cord syndrome | 1 | 2 | 3 |
| 806.29 | T7-T12 level with other specified spinal cord injury | 24 | 10 | 34 |
| 806.3 | <i>Dorsal (thoracic), open</i> | | | |
| 806.30 | T1-T6 level with unspecified spinal cord injury | 2 | 0 | 2 |
| 806.31 | T1-T6 level with complete lesion of cord | 3 | 1 | 4 |
| 806.35 | T7-T12 level with unspecified spinal cord injury | 1 | 1 | 2 |
| 806.36 | T7-T12 level with complete lesion of cord | 1 | 1 | 2 |
| 806.39 | T7-T12 level with other specified spinal cord injury | 1 | 2 | 3 |
| 806.4 | <i>Lumbar, closed</i> | 78 | 29 | 107 |
| 806.5 | <i>Lumbar, open</i> | 5 | 1 | 6 |
| 806.6 | <i>Sacrum and coccyx, closed</i> | | | |
| 806.60 | With unspecified spinal cord injury | 0 | 3 | 3 |
| 806.62 | With other cauda equina lesion | 2 | 3 | 5 |
| 806.69 | With other spinal cord injury | 2 | 0 | 2 |
| 806.7 | <i>Sacrum and coccyx, open</i> | | | |

| | | | | |
|--------------|--|-----------|-----------|-----------|
| 806.70 | With unspecified spinal cord injury | 0 | 1 | 1 |
| 806.79 | With other spinal cord injury | 2 | 0 | 2 |
| 806.8 | <i>Unspecified, closed</i> | 3 | 2 | 5 |
| 952 | Spinal cord injury without evidence of spinal bone injury | | | |
| 952.0 | <i>Cervical</i> | | | |
| 952.00 | C1-C4 level with unspecified spinal cord injury | 75 | 25 | 100 |
| 952.01 | C1-C4 level with complete lesion of spinal cord | 2 | 0 | 2 |
| 952.02 | C1-C4 level with anterior cord syndrome | 1 | 0 | 1 |
| 952.03 | C1-C4 level with central cord syndrome | 23 | 5 | 28 |
| 952.04 | C1-C4 level with other specified spinal cord injury | 6 | 5 | 11 |
| 952.05 | C1-C4 level with unspecified spinal cord injury | 32 | 7 | 39 |
| 952.06 | C1-C4 level with complete lesion of spinal cord | 2 | 4 | 6 |
| 952.08 | C5-C7 level with central cord syndrome | 14 | 6 | 20 |
| 952.09 | C5-C7 level with other specified spinal cord injury | 9 | 4 | 13 |
| 952.1 | <i>Dorsal (thoracic)</i> | | | |
| 952.10 | T1-T6 level with unspecified spinal cord injury | 7 | 4 | 11 |
| 952.11 | T1-T6 level with complete lesion of cord | 3 | 1 | 4 |
| 952.13 | T1-T6 level with central cord syndrome | 1 | 0 | 1 |
| 952.14 | T1-T6 level with other specified spinal cord injury | 2 | 0 | 2 |
| 952.15 | T7-T12 level with unspecified spinal cord injury | 13 | 3 | 16 |
| 952.16 | T7-T12 level with complete lesion of spinal cord | 1 | 0 | 1 |
| 952.19 | T7-T12 level with other specified spinal cord injury | 3 | 0 | 3 |
| 952.2 | <i>Lumbar</i> | 15 | 10 | 25 |
| 952.3 | <i>Sacral</i> | 3 | 1 | 4 |
| 952.4 | <i>Cauda Equina</i> | 5 | 1 | 6 |
| 952.8 | <i>Multiple sites of spinal cord</i> | 1 | 0 | 1 |
| 952.9 | <i>Unspecified site of spinal cord</i> | 19 | 8 | 27 |

Discharge Location

In terms of patient discharge, the most common discharge location was to the home or to self-care with 441 (47%) of patients returning to their home or the home of another. Discharges to an institution were the second most common with 215 (23%) discharges (**Graph 1.14**). These percentages did not fluctuate greatly from year to year.

Graph 1.14
Patient Discharge Location
1990-1994



Spinal Cord Injuries by County of Residence

Map 1.1 shows the spinal cord injury events by county of residence from 1990-1994. This data reflects the county in which the person lives, not necessarily the county in which the spinal cord injury occurred. As expected, counties with greater population rates had a higher number of injury events occurring to their residents.



| Table 1.6 Injuries by Year and County of Residence for 1990-1994 | | | | | | | |
|---|-------------|------|------|------|------|------|--------|
| | County | 1990 | 1991 | 1992 | 1993 | 1994 | Totals |
| 01 | Adams | | 3 | 1 | 4 | 3 | 11 |
| 02 | Ashland | | | | | | 0 |
| 03 | Barron | 1 | 2 | 2 | | | 5 |
| 04 | Bayfield | | | | 1 | | 1 |
| 05 | Brown | 6 | 7 | 6 | 13 | 9 | 41 |
| 06 | Buffalo | | | | | | 0 |
| 07 | Burnett | | | | | | 0 |
| 08 | Calumet | 2 | 3 | 1 | | 1 | 7 |
| 09 | Chippewa | 1 | 1 | 3 | 1 | 2 | 8 |
| 10 | Clark | 2 | 3 | 1 | | 3 | 9 |
| 11 | Columbia | 2 | | 2 | 2 | 3 | 9 |
| 12 | Crawford | | | | | 1 | 1 |
| 13 | Dane | 9 | 10 | 12 | 12 | 11 | 54 |
| 14 | Dodge | 4 | 4 | 6 | 4 | 2 | 20 |
| 15 | Door | | | 1 | | 2 | 3 |
| 16 | Douglas | | | | 1 | | 1 |
| 17 | Dunn | 1 | 1 | 1 | 1 | | 4 |
| 18 | Eau Claire | 2 | 4 | 6 | 3 | 1 | 16 |
| 19 | Florence | 1 | | | | | 1 |
| 20 | Fond Du Lac | 7 | 3 | 2 | 3 | 3 | 18 |
| 21 | Forest | | | | | | 0 |
| 22 | Grant | 3 | 1 | 2 | | 3 | 9 |
| 23 | Green | | | 2 | 1 | 4 | 7 |
| 24 | Green Lake | 1 | 1 | | 1 | | 3 |
| 25 | Iowa | 3 | 1 | 3 | | | 7 |
| 26 | Iron | | | | | | 0 |
| 27 | Jackson | | 1 | | 2 | 1 | 4 |
| 28 | Jefferson | 4 | 3 | 5 | 3 | 1 | 16 |
| 29 | Juneau | 2 | 1 | 1 | | 1 | 5 |
| 30 | Kenosha | 3 | 10 | 4 | 4 | 5 | 26 |
| 31 | Kewaunee | | | | | 2 | 2 |
| 32 | LaCrosse | 4 | 1 | 3 | 1 | 2 | 11 |
| 33 | Lafayette | | 1 | | | 1 | 2 |
| 34 | Langlade | 2 | | | 1 | | 3 |
| 35 | Lincoln | 2 | 4 | 2 | 2 | 1 | 11 |
| 36 | Manitowoc | 3 | 5 | 4 | | 1 | 13 |
| 37 | Marathon | 4 | 5 | 6 | 4 | 8 | 27 |
| 38 | Marinette | 1 | 4 | 2 | 5 | 3 | 15 |
| 39 | Marquette | 1 | 2 | 1 | 1 | 4 | 9 |
| 40 | Menominee | | 1 | | | | 1 |

| | County | 1990 | 1991 | 1992 | 1993 | 1994 | Totals |
|--------------|---------------|-------------|-------------|-------------|-------------|-------------|---------------|
| 41 | Milwaukee | 54 | 43 | 40 | 39 | 32 | 208 |
| 42 | Monroe | 2 | 2 | 1 | 1 | 3 | 9 |
| 43 | Oconto | 4 | 2 | 3 | 2 | 1 | 12 |
| 44 | Oneida | 2 | 3 | 1 | 2 | | 8 |
| 45 | Outagamie | 6 | 8 | 9 | 7 | 10 | 40 |
| 46 | Ozaukee | 3 | 2 | 1 | 3 | 2 | 11 |
| 47 | Pepin | | | | | | 0 |
| 48 | Pierce | | | | | 1 | 1 |
| 49 | Polk | | | | | 1 | 1 |
| 50 | Portage | 3 | | 1 | 4 | 1 | 9 |
| 51 | Price | | 1 | 2 | 1 | 1 | 5 |
| 52 | Racine | 5 | 7 | 6 | 6 | 10 | 34 |
| 53 | Richland | 2 | 1 | | 2 | 1 | 6 |
| 54 | Rock | 2 | 1 | 5 | 9 | 3 | 20 |
| 55 | Rusk | | 1 | | | 2 | 3 |
| 56 | St. Croix | | | | | | 0 |
| 57 | Sauk | 5 | 4 | | 4 | 2 | 15 |
| 58 | Sawyer | | | | 1 | | 1 |
| 59 | Shawano | 1 | 3 | 2 | 1 | | 7 |
| 60 | Sheboygan | 4 | 6 | 2 | 3 | 1 | 16 |
| 61 | Taylor | 4 | | | | | 4 |
| 62 | Trempealeau | 1 | 2 | 1 | 1 | | 5 |
| 63 | Vernon | 2 | | 1 | | 1 | 4 |
| 64 | Vilas | 2 | 2 | 2 | 3 | 1 | 10 |
| 65 | Walworth | 3 | 1 | 2 | 6 | 4 | 16 |
| 66 | Washburn | | | 1 | | 1 | 2 |
| 67 | Washington | 5 | 1 | 5 | 4 | 4 | 19 |
| 68 | Waukesha | 4 | 6 | 11 | 2 | 8 | 31 |
| 69 | Waupaca | 7 | 2 | 6 | 3 | 4 | 22 |
| 70 | Waushara | | 2 | | | 2 | 4 |
| 71 | Winnebago | 9 | 5 | | 5 | 7 | 26 |
| 72 | Wood | 3 | 5 | 5 | 1 | 2 | 16 |
| State Totals | | 204 | 192 | 186 | 180 | 183 | 945 |



**Appendix 1.1:
Hospitals and E-Codes,
1990—1994**

Hospitals Reporting SCI

| Table 1.7 Hospitals Reporting SCI | | |
|--|-----------------|-------------|
| HOSPITAL | CITY | COUNTY |
| Langlade Memorial Hospital | Antigo | Langlade |
| Appleton Medical Center | Appleton | Outagamie |
| St. Elizabeth Hospital | Appleton | Outagamie |
| St. Clare Hospital and Health Services | Baraboo | Sauk |
| Beaver Dam Community Hospitals, Inc. | Beaver Dam | Dodge |
| Beloit Memorial Hospital | Beloit | Rock |
| Elmbrook Memorial Hospital | Brookfield | Waukesha |
| Memorial Hospital Corp. of Burlington | Burlington | Racine |
| St. Joseph's Hospital | Chippewa Falls | Chippewa |
| Clintonville Area Health Center | Clintonville | Waupaca |
| Trinity Memorial Hospital | Cudahy | Milwaukee |
| Cumberland Memorial Hospital and ECU | Cumberland | Barron |
| Memorial Hospital of Iowa County, Inc. | Dodgeville | Iowa |
| Luther Hospital | Eau Claire | Eau Claire |
| Sacred Heart Hospital | Eau Claire | Eau Claire |
| Memorial Community Hospital | Edgerton | Rock |
| Lakewood Medical Center, Inc. | Elkhorn | Walworth |
| St. Agnes Hospital | Fond Du Lac | Fond Du Lac |
| Fort Atkinson Memorial Health Services | Fort Atkinson | Jefferson |
| Adams County Memorial Hospital | Friendship | Adams |
| Bellin Memorial Hospital | Green Bay | Brown |
| St. Mary's Hospital Medical Center | Green Bay | Brown |
| St. Vincent Hospital | Green Bay | Brown |
| Hayward Area Memorial Hospital | Hayward | Sawyer |
| Mercy Health System Corporation | Janesville | Rock |
| Kenosha Hospital and Medical Center | Kenosha | Kenosha |
| St. Catherine's Hospital, Inc. | Kenosha | Kenosha |
| Lutheran Hospital – La Crosse | La Crosse | La Crosse |
| Franciscan Skemp Medical Center, Inc. | La Crosse | La Crosse |
| Lancaster Memorial Hospital and Clinics | Lancaster | Grant |
| Meriter Hospital, Inc. | Madison | Dane |
| St. Mary's Hospital Medical Center | Madison | Dane |
| University of Wisconsin Hospital and Clinics | Madison | Dane |
| Holy Family Medical Center | Manitowoc | Manitowoc |
| Bay Area Medical Center | Marinette | Marinette |
| Saint Joseph's Hospital | Marshfield | Wood |
| Hess Memorial Hospital | Mauston | Juneau |
| Community Memorial Hospital | Menomonee Falls | Waukesha |
| Good Samaritan Health Center | Merill | Lincoln |

| HOSPITAL | CITY | COUNTY |
|---|-----------------|---------------|
| Children's Hospital of Wisconsin | Milwaukee | Milwaukee |
| Columbia Hospital, Inc. | Milwaukee | Milwaukee |
| Froedtert Memorial Lutheran Hospital | Milwaukee | Milwaukee |
| Sacred Heart Rehabilitation Institute | Milwaukee | Milwaukee |
| St. Francis Hospital | Milwaukee | Milwaukee |
| St. Joseph's Hospital – Milwaukee | Milwaukee | Milwaukee |
| St. Luke's Medical Center | Milwaukee | Milwaukee |
| St. Mary's Hospital – Milwaukee | Milwaukee | Milwaukee |
| St . Michael Hospital | Milwaukee | Milwaukee |
| Theda Clark Medical Center | Neenah | Winnebago |
| Memorial Hospital, Inc. | Neillsville | Clark |
| New London Family Medical Center | New London | Juneau |
| Memorial Hospital at Oconomowoc | Oconomowoc | Waukesha |
| Community Memorial Hospital | Oconto Falls | Oconto |
| Mercy Medical Center | Oshkosh | Winnebago |
| Flambeau Hospital, Inc. | Park Falls | Price |
| Southwest Health Center, Inc. | Platteville | Grant |
| Valley View Medical Center | Plymouth | Sheboygan |
| St. Mary's Hospital – Ozaukee | Mequon | Ozaukee |
| Divine Savior Hospital and NSG Home, Inc. | Portage | Columbia |
| Sauk Prairie Memorial Hospital | Prairie Du Sac | Sauk |
| St. Luke's Memorial Hospital | Racine | Racine |
| Saint Mary's Medical Center | Racine | Racine |
| Reedsburg Area Medical Center | Reedsburg | Sauk |
| Saint Mary's Hospital, Inc. | Rhineland | Oneida |
| Ripon Medical Center | Ripon | Fond Du Lac |
| Sheboygan Memorial Medical Center | Sheboygan | Sheboygan |
| St. Nicholas Hospital | Sheboygan | Sheboygan |
| Franciscan Skemp Healthcare - Sparta | Sparta | Monroe |
| St. Croix Valley Memorial Hospital | St. Croix Falls | Polk |
| Saint Michael's Hospital | Stevens Point | Portage |
| St. Mary's Hospital of Superior | Superior | Douglas |
| Two Rivers Community Hospital, Inc. | Two Rivers | Manitowoc |
| Waukesha Memorial Hospital, Inc. | Waukesha | Waukesha |
| Riverside Medical Center | Waupaca | Waupaca |
| Wausau Hospital | Wausau | Marathon |
| Lakeview Hospital | Milwaukee | Milwaukee |
| John L. Doyle Hospital | Wauwatosa | Milwaukee |
| West Allis Memorial Hospital | West Allis | Milwaukee |
| Howard Young Medical Center, Inc. | Woodruff | Oneida |
| Sinai Samaritan Medical Center | Milwaukee | Milwaukee |
| Holy Family Memorial Medical Center | Manitowoc | Manitowoc |

Table 1.8

E-Codes

| <i>E-code</i> | <i>Description</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
|----------------------|--|---------------------|--------------------|----------------------|
| 8100 | Traffic accidents with train, driver | 4 | 4 | 0 |
| 8120 | Traffic accidents with motor vehicle, driver | 27 | 20 | 7 |
| 8121 | Traffic accidents with motor vehicle, passenger | 13 | 5 | 8 |
| 8122 | Traffic accidents with motor vehicle, motorcyclist | 4 | 4 | 0 |
| 8128 | Traffic accidents with motor vehicle, other specified person | 1 | 1 | 0 |
| 8129 | Traffic accidents with motor vehicle, unspecified person | 2 | 2 | 0 |
| 8130 | Motor vehicle with other vehicle, driver | 3 | 2 | 1 |
| 8131 | Motor vehicle with other vehicle, passenger | 1 | 1 | 0 |
| 8136 | Motor vehicle with other vehicle, pedal cyclist | 1 | 0 | 1 |
| 8147 | Motor vehicle collision with pedestrian, pedestrian | 9 | 5 | 4 |
| 8150 | Collision on highway accident, driver | 7 | 5 | 2 |
| 8151 | Collision on highway accident, passenger | 3 | 1 | 2 |
| 8152 | Collision on highway accident, motorcyclist | 3 | 3 | 0 |
| 8159 | Collision on highway accident, unspecified person | 1 | 1 | 0 |
| 8160 | Motor vehicle-loss of control, driver | 54 | 38 | 16 |
| 8161 | Motor vehicle-loss of control, passenger | 23 | 17 | 6 |
| 8162 | Motor vehicle-loss of control, motorcyclist | 9 | 9 | 0 |
| 8163 | Motor vehicle-loss of control, passenger on motorcycle | 2 | 1 | 1 |
| 8169 | Motor vehicle-loss of control, unspecified person | 4 | 3 | 1 |
| 8180 | Non-collision motor vehicle, driver | 2 | 1 | 1 |
| 8181 | Non-collision motor vehicle, passenger | 2 | 1 | 1 |
| 8182 | Non-collision motor vehicle, motorcyclist | 2 | 2 | 0 |
| 8187 | Non-collision motor vehicle, pedestrian | 1 | 1 | 0 |
| 8189 | Non-collision motor vehicle, unspecified person | 1 | 1 | 0 |
| 8190 | Unspecified motor vehicle accident, driver | 18 | 13 | 5 |
| 8191 | Unspecified motor vehicle accident, passenger | 12 | 6 | 6 |
| 8192 | Unspecified motor vehicle accident, motorcyclist | 10 | 10 | 0 |
| 8193 | Unspecified motor vehicle accident, passenger of motorcycle | 1 | 1 | 0 |
| 8199 | Unspecified motor vehicle accident, unspecified person | 5 | 3 | 2 |
| 8200 | Non-traffic accident (snow vehicle), driver | 5 | 4 | 1 |
| 8209 | Non-traffic accident (snow vehicle), unspecified person | 1 | 1 | 0 |
| 8210 | Off-road motor vehicle, driver | 8 | 7 | 1 |
| 8212 | Off-road motor vehicle, passenger | 3 | 3 | 0 |

| | | | | |
|------|---|----|----|----|
| 8217 | Off-road motor vehicle, pedestrian | 1 | 0 | 1 |
| 8232 | Collision with stationary object, passenger | 1 | 1 | 0 |
| 8251 | Unspecified motor vehicle, passenger | 1 | 0 | 1 |
| 8259 | Unspecified motor vehicle, unspecified person | 1 | 1 | 0 |
| 8261 | Pedal cycle accident, pedal cyclist | 4 | 4 | 0 |
| 8282 | Animal being driven, rider of animal | 2 | 1 | 1 |
| 8321 | Submersion or drowning in water transport, occupant of small boat | 1 | 0 | 1 |
| 8415 | Accident to powered aircraft, occupant | 2 | 1 | 1 |
| 8447 | Other specified air transport accidents, parachutist | 2 | 2 | 0 |
| 848 | Other vehicles | 2 | 1 | 1 |
| 8760 | Misadventures during medical care, mismatched blood | 1 | 1 | 0 |
| 8788 | Surgical Ops & Procedures, other specified | 1 | 1 | 0 |
| 8798 | Other procedures, blood transfusion | 1 | 0 | 1 |
| 8809 | Fall from stairs or steps, other stairs or steps | 26 | 18 | 8 |
| 8810 | Fall from ladder | 10 | 9 | 1 |
| 8811 | Fall from scaffolding | 5 | 5 | 0 |
| 882 | Fall from or out of building | 19 | 16 | 3 |
| 8830 | Accident from diving or jumping into water | 23 | 21 | 2 |
| 8841 | Fall from cliff | 3 | 2 | 1 |
| 8842 | Fall from chair | 7 | 4 | 3 |
| 8849 | Fall from one level to another | 31 | 25 | 6 |
| 885 | Fall from same level, slip, trip, or stumble | 20 | 13 | 7 |
| 8860 | Fall on same level, collision, pushing, or shoving, in sports | 3 | 3 | 0 |
| 887 | Fracture, cause unspecified | 2 | 1 | 1 |
| 888 | Other & unspecified fall | 38 | 23 | 15 |
| 916 | Struck by falling object | 9 | 8 | 1 |
| 9170 | Struck by objects or persons – in sports | 8 | 7 | 1 |
| 9179 | Struck by objects or persons – other | 7 | 5 | 2 |
| 918 | Caught in or between objects | 1 | 1 | 0 |
| 9192 | Machinery accident, lifting machine & appliances | 2 | 1 | 1 |
| 9222 | Accident caused by firearm, hunting rifle | 1 | 1 | 0 |
| 9228 | Accident caused by firearm, other specified firearm | 1 | 1 | 0 |
| 9229 | Accident caused by firearm, unspecified firearm | 9 | 7 | 2 |
| 927 | Overexertion and strenuous movements | 3 | 2 | 1 |
| 9289 | Environmental & accident causes, unspecified accident | 3 | 2 | 1 |
| 9293 | Late effects of accidental fall | 1 | 1 | 0 |
| 9305 | Antibiotics, Cephalosporin group | 1 | 1 | 0 |
| 9309 | Antibiotics, unspecified | 2 | 1 | 1 |
| 9310 | Other anti-infectives , sulfonamides | 1 | 1 | 0 |
| 9320 | Hormones & synthetic substitutes, adrenal cortical | 2 | 1 | 1 |

| | | | | |
|------|--|-----------|----|----------|
| | steroids | | | |
| 9363 | Anticonvulsants, other and unspecified | 1 | 1 | 0 |
| 9379 | Sedatives & hypnotics , unspecified | 1 | 1 | 0 |
| 9382 | CNS depressants & anesthetics, gaseous | 1 | 1 | 0 |
| 9390 | Psychotropic agents, antidepressants | 1 | 1 | 0 |
| 9460 | Anti-infectives & anti-inflammatory drugs, local | 1 | 1 | 0 |
| 9478 | Other drugs, unspecified | 1 | 1 | 0 |
| 9550 | Suicide/self-inflicted injury, by firearms, handgun | 2 | 1 | 1 |
| 9554 | Suicide/self-inflicted injury, other and unspecified firearm | 6 | 3 | 3 |
| 9571 | Suicide/self-inflicted injury, jumping from high place, other man-made structure | 1 | 0 | 1 |
| 9585 | Suicide/self-inflicted injury, other, crashing of motor vehicle | 1 | 1 | 0 |
| 9600 | Fight/ brawl/ rape, unarmed fight or brawl | 6 | 3 | 3 |
| 9650 | Assault by firearms, handgun | 3 | 2 | 1 |
| 9654 | Assault by firearms, other & unspecified firearms | 24 | 22 | 2 |
| 966 | Assault by cutting/piercing instrument | 2 | 1 | 1 |
| 9850 | Intention unknown accident, handgun | 1 | 1 | 0 |
| 9854 | Intention unknown accident, other & unspecified firearm | 5 | 5 | 1 |
| 9870 | Intention unknown accident, fall from high place (residential premises) | 1 | 0 | 1 |
| 9879 | Intention unknown accident, fall from high place (unspecified site) | 1 | 1 | 0 |



Appendix 1.2:
Spinal Cord Injuries by Year, 1990—1994

Table 1.9
1990 Data

| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
|---------------------------------|--------------|-------------|---------------|
| INCIDENCE | | | |
| Incidence (by gender) | 204 | 151 | 53 |
| AGE | | | |
| 0-15 | 9 | 5 | 4 |
| 16-30 | 83 | 62 | 21 |
| 31-45 | 42 | 35 | 7 |
| 46-60 | 22 | 19 | 3 |
| 61-75 | 28 | 19 | 9 |
| 75+ | 20 | 11 | 9 |
| RACE | | | |
| American Indian, Native Alaskan | 0 | 0 | 0 |
| Asian, Pacific Islander | 0 | 0 | 0 |
| Black | 10 | 8 | 2 |
| White | 89 | 70 | 19 |
| Other | 4 | 3 | 1 |
| Unknown | 23 | 18 | 5 |
| Not Reported | 78 | 52 | 26 |
| ADMISSION MONTH | | | |
| January | 13 | 7 | 6 |
| February | 14 | 10 | 4 |
| March | 14 | 9 | 5 |
| April | 16 | 15 | 1 |
| May | 16 | 10 | 6 |
| June | 24 | 18 | 6 |
| July | 26 | 19 | 7 |
| August | 20 | 15 | 5 |
| September | 15 | 12 | 3 |
| October | 13 | 9 | 4 |
| November | 18 | 13 | 5 |
| December | 15 | 14 | 1 |
| ADMISSION DAY | | | |
| Monday | 32 | 22 | 10 |
| Tuesday | 22 | 13 | 9 |
| Wednesday | 26 | 17 | 9 |
| Thursday | 30 | 22 | 8 |
| Friday | 22 | 15 | 7 |
| Saturday | 39 | 33 | 6 |
| Sunday | 33 | 29 | 4 |
| ADMISSION TYPE | | | |
| Emergency | 134 | 95 | 39 |
| Urgent | 59 | 48 | 11 |
| Elective | 11 | 8 | 3 |

| (1990 Data, Continued) | | | |
|--|--------------|-------------|---------------|
| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
| ADMISSION SOURCE | | | |
| Physician referral | 18 | 11 | 7 |
| Clinic referral | 0 | 0 | 0 |
| HMO referral | 0 | 0 | 0 |
| Transfer from hospital | 18 | 11 | 7 |
| Transfer from skilled nursing facility | 0 | 0 | 0 |
| Transfer from another health care facility | 11 | 11 | 0 |
| Emergency room | 154 | 116 | 38 |
| Court, law enforcement | 0 | 0 | 0 |
| Information not available | 3 | 2 | 1 |
| LENGTH OF INPATIENT STAY | | | |
| Total number of days | 7,184 | 5,515 | 1,669 |
| Average number of days | 35.2 | 36.5 | 31.5 |
| COST OF INPATIENT HOSPITAL DATA | | | |
| Total | \$11,330,499 | \$8,999,212 | \$2,331,287 |
| Average | \$55,542 | \$59,597 | \$43,986 |
| MOST FREQUENT CAUSES OF INJURY | | | |
| 1. Falls | 23 | 16 | 7 |
| 2. Motor vehicle crashes | 22 | 17 | 5 |
| 3. Other transportation injuries | 8 | 4 | 4 |
| 4. Assault | 7 | 5 | 2 |
| 5. Other injury events | 6 | 5 | 1 |
| 6. Therapeutic substances | 2 | 2 | 0 |
| 7. Intention unclear | 2 | 2 | 0 |
| 8. Unknown | 134 | 100 | 34 |
| LEVEL OF SEVERITY | | | |
| Tetraplegia | 110 | 78 | 32 |
| Paraplegia | 94 | 73 | 21 |
| PATIENT DISCHARGE LOCATION | | | |
| Discharged to home or self-care | 87 | 61 | 26 |
| Discharged or transferred to another short-term general hospital | 30 | 24 | 6 |
| Discharged or transferred to a skilled nursing facility | 6 | 3 | 3 |
| Discharged or transferred to an intermediate care facility | 0 | 0 | 0 |
| Discharged or transferred to another type of institution | 59 | 49 | 10 |
| Discharged or transferred to home under care of organized health service | 11 | 5 | 6 |
| Expired or did not recover | 11 | 9 | 2 |

Table 1.10
1991 Data

| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
|---------------------------------|--------------|-------------|---------------|
| INCIDENCE | | | |
| Incidence (by gender) | 192 | 150 | 42 |
| AGE | | | |
| 0-15 | 8 | 5 | 3 |
| 16-30 | 84 | 72 | 12 |
| 31-45 | 48 | 34 | 14 |
| 46-60 | 13 | 12 | 1 |
| 61-75 | 16 | 11 | 5 |
| 75+ | 23 | 16 | 7 |
| RACE | | | |
| American Indian, Native Alaskan | 1 | 1 | 0 |
| Asian, Pacific Islander | 2 | 2 | 0 |
| Black | 19 | 14 | 5 |
| White | 140 | 113 | 27 |
| Other | 4 | 3 | 1 |
| Unknown | 26 | 17 | 9 |
| Not Reported | 0 | 0 | 0 |
| ADMISSION MONTH | | | |
| January | 17 | 12 | 5 |
| February | 10 | 10 | 0 |
| March | 8 | 7 | 1 |
| April | 15 | 12 | 3 |
| May | 17 | 10 | 7 |
| June | 20 | 16 | 4 |
| July | 23 | 17 | 6 |
| August | 16 | 12 | 4 |
| September | 22 | 16 | 6 |
| October | 18 | 16 | 2 |
| November | 15 | 13 | 2 |
| December | 11 | 9 | 2 |
| ADMISSION DAY | | | |
| Monday | 33 | 24 | 9 |
| Tuesday | 25 | 16 | 9 |
| Wednesday | 24 | 17 | 7 |
| Thursday | 26 | 21 | 5 |
| Friday | 29 | 24 | 5 |
| Saturday | 25 | 21 | 4 |
| Sunday | 30 | 27 | 3 |
| ADMISSION TYPE | | | |
| Emergency | 108 | 83 | 25 |
| Urgent | 70 | 53 | 17 |
| Elective | 14 | 14 | 0 |

| (1991 Data, Continued) | | | |
|--|--------------|--------------|---------------|
| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
| ADMISSION SOURCE | | | |
| Physician referral | 20 | 17 | 3 |
| Clinic referral | 0 | 0 | 0 |
| HMO referral | 1 | 1 | 0 |
| Transfer from hospital | 15 | 9 | 6 |
| Transfer from skilled nursing facility | 0 | 0 | 0 |
| Transfer from another health care facility | 30 | 24 | 6 |
| Emergency room | 125 | 98 | 27 |
| Court, law enforcement | 1 | 1 | 0 |
| Information not available | 0 | 0 | 0 |
| LENGTH OF INPATIENT STAY | | | |
| Total number of days | 8,002 | 6,519 | 1,483 |
| Average number of days | 41.7 | 43.5 | 35.3 |
| COST OF INPATIENT HOSPITAL CARE | | | |
| Total | \$13,235,822 | \$10,660,211 | \$2,575,611 |
| Average | \$68,937 | \$71,068 | \$61,324 |
| MOST FREQUENT CAUSES OF INJURY | | | |
| 1. Motor vehicle crashes | 45 | 37 | 8 |
| 2. Falls | 32 | 25 | 7 |
| 3. Other injury events | 15 | 11 | 4 |
| 4. Therapeutic substances | 8 | 7 | 1 |
| 5. Assault | 5 | 3 | 2 |
| 6. Other transportation injuries | 4 | 2 | 2 |
| 7. Self-inflicted injuries | 4 | 2 | 2 |
| 8. Intention unclear | 2 | 2 | 0 |
| 9. Unknown | 77 | 61 | 16 |
| LEVEL OF SEVERITY | | | |
| Tetraplegia | 102 | 83 | 19 |
| Paraplegia | 90 | 67 | 23 |
| PATIENT DISCHARGE LOCATION | | | |
| Discharged to home or self-care | 91 | 71 | 20 |
| Discharged or transferred to another short-term general hospital | 19 | 14 | 5 |
| Discharged or transferred to a skilled nursing facility | 11 | 9 | 2 |
| Discharged or transferred to another type of institution | 41 | 32 | 9 |
| Discharged or transferred to home under care of organized health service | 16 | 13 | 3 |
| Left against medical advice | 4 | 4 | 0 |
| Expired or did not recover | 10 | 7 | 3 |

Table 1.11
1992 Data

| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
|---------------------------------|--------------|-------------|---------------|
| INCIDENCE | | | |
| Incidence (by gender) | 186 | 125 | 61 |
| AGE | | | |
| 0-15 | 10 | 5 | 5 |
| 16-30 | 61 | 47 | 14 |
| 31-45 | 49 | 39 | 10 |
| 46-60 | 20 | 13 | 7 |
| 61-75 | 24 | 10 | 14 |
| 75+ | 22 | 11 | 11 |
| RACE | | | |
| American Indian, Native Alaskan | 1 | 1 | 0 |
| Asian, Pacific Islander | 1 | 0 | 1 |
| Black | 21 | 17 | 4 |
| White | 147 | 96 | 51 |
| Other | 0 | 0 | 0 |
| Unknown | 16 | 11 | 5 |
| Not Reported | 0 | 0 | 0 |
| ADMISSION MONTH | | | |
| January | 19 | 9 | 10 |
| February | 10 | 8 | 2 |
| March | 8 | 5 | 3 |
| April | 16 | 10 | 6 |
| May | 18 | 10 | 8 |
| June | 17 | 14 | 3 |
| July | 16 | 14 | 2 |
| August | 18 | 10 | 8 |
| September | 21 | 16 | 5 |
| October | 18 | 12 | 6 |
| November | 14 | 11 | 3 |
| December | 11 | 6 | 5 |
| ADMISSION DAY | | | |
| Monday | 30 | 18 | 12 |
| Tuesday | 22 | 11 | 11 |
| Wednesday | 31 | 21 | 10 |
| Thursday | 18 | 9 | 9 |
| Friday | 28 | 21 | 7 |
| Saturday | 24 | 18 | 6 |
| Sunday | 33 | 27 | 6 |
| ADMISSION TYPE | | | |
| Emergency | 119 | 85 | 34 |
| Urgent | 57 | 34 | 23 |
| Elective | 10 | 6 | 4 |

| (1992 Data, Continued) | | | |
|--|--------------|-------------|---------------|
| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
| ADMISSION SOURCE | | | |
| Physician referral | 18 | 7 | 11 |
| Clinic referral | 3 | 1 | 2 |
| HMO referral | 0 | 0 | 0 |
| Transfer from hospital | 15 | 9 | 6 |
| Transfer from skilled nursing facility | 0 | 0 | 0 |
| Transfer from another health care facility | 12 | 10 | 2 |
| Emergency room | 138 | 98 | 40 |
| Court, law enforcement | 0 | 0 | 0 |
| Information not available | 0 | 0 | 0 |
| LENGTH OF INPATIENT STAY | | | |
| Total number of days | 6,510 | 4,629 | 1,881 |
| Average number of days | 35.0 | 37.0 | 30.8 |
| COST OF INPATIENT HOSPITAL CARE | | | |
| Total | \$12,036,397 | \$8,748,209 | \$3,308,188 |
| Average | \$64,711 | \$69,826 | \$54,232 |
| MOST FREQUENT CAUSES OF INJURY | | | |
| 1. Motor vehicle crashes | 43 | 30 | 13 |
| 2. Falls | 29 | 19 | 10 |
| 3. Assaults | 9 | 7 | 2 |
| 4. Other injury events | 9 | 6 | 3 |
| 5. Other transportation injuries | 4 | 3 | 1 |
| 6. Self-inflicted injuries | 3 | 2 | 1 |
| 7. Therapeutic substances | 2 | 1 | 1 |
| 8. Intention unclear | 0 | 0 | 0 |
| 9. Unknown | 87 | 57 | 30 |
| LEVEL OF SEVERITY | | | |
| Tetraplegia | 106 | 75 | 31 |
| Paraplegia | 80 | 50 | 30 |
| PATIENT DISCHARGE LOCATION | | | |
| Discharged to home or self-care | 92 | 69 | 23 |
| Discharged or transferred to another short-term general hospital | 24 | 15 | 9 |
| Discharged or transferred to a skilled nursing facility | 12 | 5 | 7 |
| Discharged or transferred to an intermediate care facility | 1 | 1 | 0 |
| Discharged or transferred to another type of institution | 31 | 19 | 12 |
| Discharged or transferred to home under care of organized health service | 15 | 6 | 9 |
| Expired or did not recover | 11 | 10 | 1 |

Table 1.12
1993 Data

| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
|---------------------------------|--------------|-------------|---------------|
| INCIDENCE | | | |
| Incidence (by gender) | 180 | 128 | 52 |
| AGE | | | |
| 0-15 | 12 | 8 | 4 |
| 16-30 | 64 | 47 | 17 |
| 31-45 | 50 | 36 | 14 |
| 46-60 | 22 | 19 | 3 |
| 61-75 | 20 | 11 | 9 |
| 75+ | 12 | 7 | 5 |
| RACE | | | |
| American Indian, Native Alaskan | 1 | 0 | 1 |
| Asian, Pacific Islander | 0 | 0 | 0 |
| Black | 9 | 4 | 5 |
| White | 162 | 117 | 45 |
| Other | 2 | 1 | 1 |
| Unknown | 6 | 6 | 0 |
| Not Reported | 0 | 0 | 0 |
| ADMISSION MONTH | | | |
| January | 16 | 9 | 7 |
| February | 12 | 8 | 4 |
| March | 20 | 14 | 6 |
| April | 11 | 6 | 5 |
| May | 8 | 6 | 2 |
| June | 13 | 9 | 4 |
| July | 17 | 13 | 4 |
| August | 13 | 8 | 5 |
| September | 22 | 17 | 5 |
| October | 22 | 17 | 5 |
| November | 17 | 14 | 3 |
| December | 9 | 7 | 2 |
| ADMISSION DAY | | | |
| Monday | 32 | 18 | 14 |
| Tuesday | 22 | 14 | 8 |
| Wednesday | 23 | 15 | 8 |
| Thursday | 18 | 12 | 6 |
| Friday | 25 | 19 | 6 |
| Saturday | 33 | 27 | 6 |
| Sunday | 27 | 23 | 4 |
| ADMISSION TYPE | | | |
| Emergency | 101 | 75 | 26 |
| Urgent | 67 | 45 | 22 |
| Elective | 12 | 8 | 4 |

| (1993 Data, Continued) | | | |
|--|--------------|--------------|---------------|
| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
| ADMISSION SOURCE | | | |
| Physician referral | 14 | 8 | 6 |
| Clinic referral | 0 | 0 | 0 |
| HMO referral | 0 | 0 | 0 |
| Transfer from hospital | 13 | 9 | 4 |
| Transfer from skilled nursing facility | 0 | 0 | 0 |
| Transfer from another health care facility | 14 | 10 | 4 |
| Emergency room | 139 | 101 | 38 |
| Court, law enforcement | 0 | 0 | 0 |
| Information not available | 0 | 0 | 0 |
| LENGTH OF INPATIENT STAY | | | |
| Total number of days | 7,542 | 5,505 | 2,037 |
| Average number of days | 41.9 | 43.0 | 39.2 |
| COST OF INPATIENT HOSPITAL CARE | | | |
| Total | \$13,562,531 | \$10,668,262 | \$2,894,269 |
| Average | \$75,347 | \$83,346 | \$55,659 |
| MOST FREQUENT CAUSES OF INJURY | | | |
| 1. Motor vehicle crashes | 42 | 27 | 15 |
| 2. Falls | 41 | 31 | 10 |
| 3. Other transportation injuries | 8 | 7 | 1 |
| 4. Other injury events | 6 | 5 | 1 |
| 5. Assault | 5 | 5 | 0 |
| 6. Intention unclear | 3 | 2 | 1 |
| 7. Self-inflicted injuries | 2 | 1 | 1 |
| 8. Therapeutic substances | 0 | 0 | 0 |
| 9. Unknown | 73 | 50 | 23 |
| LEVEL OF SEVERITY | | | |
| Tetraplegia | 93 | 69 | 25 |
| Paraplegia | 86 | 59 | 27 |
| PATIENT DISCHARGE LOCATION | | | |
| Discharged to home or self-care | 82 | 56 | 26 |
| Discharged or transferred to another short-term general hospital | 25 | 16 | 9 |
| Discharged or transferred to a skilled nursing facility | 5 | 3 | 2 |
| Discharged or transferred to another type of institution | 37 | 30 | 7 |
| Discharged or transferred to home under care of organized health service | 25 | 18 | 7 |
| Expired or did not recover | 6 | 5 | 1 |

Table 1.13
1994 Data

| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
|---------------------------------|--------------|-------------|---------------|
| INCIDENCE | | | |
| Incidence (by gender) | 183 | 136 | 47 |
| AGE | | | |
| 0-15 | 3 | 2 | 1 |
| 16-30 | 65 | 53 | 12 |
| 31-45 | 36 | 29 | 7 |
| 46-60 | 32 | 25 | 7 |
| 61-75 | 30 | 16 | 14 |
| 75+ | 17 | 11 | 6 |
| RACE | | | |
| American Indian, Native Alaskan | 0 | 0 | 0 |
| Asian, Pacific Islander | 0 | 0 | 0 |
| Black | 14 | 9 | 5 |
| White | 158 | 118 | 40 |
| Other | 3 | 3 | 0 |
| Unknown | 2 | 1 | 1 |
| Not Reported | 6 | 5 | 1 |
| ADMISSION MONTH | | | |
| January | 12 | 7 | 5 |
| February | 13 | 9 | 4 |
| March | 13 | 10 | 3 |
| April | 16 | 11 | 5 |
| May | 11 | 9 | 2 |
| June | 14 | 11 | 3 |
| July | 20 | 17 | 3 |
| August | 25 | 21 | 4 |
| September | 16 | 11 | 5 |
| October | 16 | 13 | 3 |
| November | 11 | 7 | 4 |
| December | 16 | 10 | 6 |
| ADMISSION DAY | | | |
| Monday | 27 | 17 | 10 |
| Tuesday | 27 | 18 | 9 |
| Wednesday | 22 | 15 | 7 |
| Thursday | 30 | 23 | 7 |
| Friday | 16 | 10 | 6 |
| Saturday | 26 | 20 | 6 |
| Sunday | 35 | 33 | 2 |
| ADMISSION TYPE | | | |
| Emergency | 112 | 87 | 25 |
| Urgent | 68 | 47 | 21 |
| Elective | 3 | 2 | 1 |

| (1994 Data, Continued) | | | |
|--|--------------|--------------|---------------|
| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
| ADMISSION SOURCE | | | |
| Physician referral | 18 | 13 | 5 |
| Clinic referral | 0 | 0 | 0 |
| HMO referral | 0 | 0 | 0 |
| Transfer from hospital | 27 | 18 | 9 |
| Transfer from skilled nursing facility | 1 | 1 | 0 |
| Transfer from another health care facility | 0 | 0 | 0 |
| Emergency room | 137 | 104 | 33 |
| Court, law enforcement | 0 | 0 | 0 |
| Information not available | 0 | 0 | 0 |
| LENGTH OF INPATIENT STAY | | | |
| Total number of days | 6,580 | 5,390 | 1,190 |
| Average number of days | 35.9 | 39.6 | 25.3 |
| COST OF INPATIENT HOSPITAL CARE | | | |
| Total | \$13,011,372 | \$10,690,564 | \$2,320,808 |
| Average | \$71,100 | \$78,607 | \$49,379 |
| MOST FREQUENT CAUSES OF INJURY | | | |
| 1. Motor vehicle crashes | 74 | 51 | 23 |
| 2. Falls | 64 | 50 | 14 |
| 3. Other transportation injuries | 11 | 11 | 0 |
| 4. Other injury events | 10 | 9 | 1 |
| 5. Assault | 8 | 7 | 1 |
| 6. Self-inflicted injuries | 2 | 1 | 1 |
| 7. Intention unclear | 1 | 0 | 1 |
| 8. Therapeutic substances | 0 | 0 | 0 |
| 9. Unknown | 13 | 7 | 6 |
| LEVEL OF SEVERITY | | | |
| Tetraplegia | 98 | 73 | 25 |
| Paraplegia | 85 | 63 | 22 |
| PATIENT DISCHARGE LOCATION | | | |
| Discharged to home or self-care | 89 | 63 | 26 |
| Discharged or transferred to another short-term general hospital | 18 | 14 | 4 |
| Discharged or transferred to a skilled nursing facility | 14 | 9 | 5 |
| Discharged or transferred to an intermediate care facility | 1 | 1 | 0 |
| Discharged or transferred to another type of institution | 47 | 40 | 7 |
| Discharged or transferred to home under care of organized health service | 10 | 6 | 4 |
| Expired or did not recover | 4 | 3 | 1 |

Table 1.14
1990 – 1994 Data

| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
|---------------------------------|--------------|-------------|---------------|
| INCIDENCE | | | |
| Incidence (by gender) | 945 | 690 | 255 |
| AGE | | | |
| 0-15 | 42 | 25 | 17 |
| 16-30 | 357 | 281 | 76 |
| 31-45 | 225 | 173 | 52 |
| 46-60 | 109 | 88 | 21 |
| 61-75 | 118 | 67 | 51 |
| 75+ | 94 | 56 | 38 |
| RACE | | | |
| American Indian, Native Alaskan | 3 | 2 | 1 |
| Asian, Pacific Islander | 3 | 2 | 1 |
| Black | 73 | 52 | 21 |
| White | 696 | 514 | 182 |
| Other | 13 | 10 | 3 |
| Unknown | 73 | 53 | 20 |
| Not Reported | 84 | 57 | 27 |
| ADMISSION MONTH | | | |
| January | 77 | 44 | 33 |
| February | 59 | 45 | 14 |
| March | 63 | 45 | 18 |
| April | 74 | 54 | 20 |
| May | 70 | 45 | 25 |
| June | 88 | 68 | 20 |
| July | 102 | 80 | 22 |
| August | 92 | 66 | 26 |
| September | 96 | 72 | 24 |
| October | 87 | 67 | 20 |
| November | 75 | 58 | 17 |
| December | 62 | 46 | 16 |
| ADMISSION DAY | | | |
| Monday | 129 | 99 | 30 |
| Tuesday | 102 | 72 | 30 |
| Wednesday | 123 | 85 | 38 |
| Thursday | 120 | 87 | 33 |
| Friday | 128 | 89 | 39 |
| Saturday | 162 | 119 | 43 |
| Sunday | 181 | 139 | 42 |
| ADMISSION TYPE | | | |
| Emergency | 574 | 425 | 149 |
| Urgent | 321 | 227 | 94 |
| Elective | 50 | 38 | 12 |

| (1990-1994 Data, Continued) | | | |
|--|--------------|--------------|---------------|
| <i>Category of Data</i> | <i>Total</i> | <i>Male</i> | <i>Female</i> |
| ADMISSION SOURCE | | | |
| Physician referral | 88 | 56 | 32 |
| Clinic referral | 3 | 1 | 2 |
| HMO referral | 1 | 1 | 0 |
| Transfer from hospital | 88 | 56 | 32 |
| Transfer from skilled nursing facility | 1 | 1 | 0 |
| Transfer from another health care facility | 67 | 55 | 12 |
| Emergency room | 693 | 517 | 176 |
| Court, law enforcement | 1 | 1 | 0 |
| Information not available | 3 | 2 | 1 |
| LENGTH OF INPATIENT STAY | | | |
| Total number of days | 35,818 | 27,558 | 8,260 |
| Average number of days | 37.9 | 39.9 | 32.3 |
| COST OF INPATIENT HOSPITAL CARE | | | |
| Total | \$63,176,621 | \$49,746,458 | \$13,430,163 |
| Average | \$66,854 | \$72,096 | \$52,667 |
| MOST FREQUENT CAUSES OF INJURY | | | |
| 1. Motor vehicle crashes | 226 | 162 | 64 |
| 2. Falls | 189 | 141 | 48 |
| 3. Other injury events | 47 | 37 | 10 |
| 4. Other transportation injuries | 35 | 26 | 9 |
| 5. Assault | 34 | 27 | 7 |
| 6. Therapeutic substances | 12 | 10 | 2 |
| 7. Self-inflicted injuries | 11 | 6 | 5 |
| 8. Intention unclear | 8 | 6 | 2 |
| 9. Unknown | 383 | 275 | 108 |
| LEVEL OF SEVERITY | | | |
| Tetraplegia | 510 | 378 | 132 |
| Paraplegia | 435 | 312 | 123 |
| PATIENT DISCHARGE LOCATION | | | |
| Discharged to home or self-care | 441 | 320 | 121 |
| Discharged or transferred to another short-term general hospital | 116 | 83 | 33 |
| Discharged or transferred to a skilled nursing facility | 48 | 29 | 19 |
| Discharged or transferred to an intermediate care facility | 2 | 2 | 0 |
| Discharged or transferred to another type of institution | 215 | 170 | 45 |
| Discharged or transferred to home under care of organized health service | 77 | 48 | 29 |
| Left against medical advice | 4 | 4 | 0 |
| Expired or did not recover | 42 | 34 | 8 |

Conclusions

The establishment of this statewide registry and surveillance program was necessary to document factors and demographics associated with the population of individuals that sustains spinal cord injuries. We believe that the data presented in this first historical report clearly indicates the major etiologies of injury, the disproportionate injuries sustained by certain race, age and gender groups, and the cost of these injuries. In the future, we hope to explore the data further to identify the location of injury, the time and the factors surrounding the injuries, and other determinants that are crucial for injury prevention.

References

Maddox, S. (1993). Spinal network (2nd ed.). Boulder, CO: Library of Congress Cataloging in Publication Data.

National Safety Council (1989). Accident facts: 1988 edition.

National Spinal Cord Injury Statistical Center (1998). Spinal cord injury: Facts and figures at a glance. Birmingham AL: The University of Alabama at Birmingham.

Johnson, R.L., Gabella, B.A., Gerhart, K.A., McCray, J., Menconi, J.C., & Whiteneck, G.G. (1997). Evaluating sources of traumatic spinal cord injury surveillance data in colorado. American Journal of Epidemiology, 146(3), 266-272.

All population estimates

Wisconsin Department of Administration (1998). Madison, WI: Demographic Services Center.

